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CIVITATIS REGIMINE DONATA AD 1822

ENGINEERING DEPARTMENT.

THIRTIETH ANNUAL REPORT

OF THE

With Compliments of

William Jackson,

City Engineer.

BOSTON:
MUNICIPAL PRINTING OFFICE,
1897.

ENGINEERING DEPARTMENT.

THIRTIETH ANNUAL REPORT

OF THE

CITY ENGINEER,

BOSTON,

FOR THE YEAR 1896.

Printed for the Department.

BOSTON:
MUNICIPAL PRINTING OFFICE,
1897.

Stone + Webster
Dec. 8. 1903.

Engineering Department, City Hall,
Boston, Feb. 1, 1897.

Hon. Josiah Quincy,

Mayor of the City of Boston:

Sir: In compliance with the Revised Ordinances the following report of the expenses and operations of the department for the year ending Jan. 31, 1897, is submitted: —

The report of the work done by this department may be classified under the following heads: —

A. — The examination and supervision of structural repairs of bridges, the designing and superintending the construction of new bridges, retaining walls, city wharves, etc., and in miscellaneous engineering work called for by the City Council, the giving of lines and grades for property-owners and builders, the making of plans and profiles for the Street Commissioners, and the making of survey plans, etc., for the various city departments.

B. — Charge of the engineering work in connection with the Sudbury-river, Cochituate, and Mystic Water-Works, including charge of new constructions for these works.

C. — Charge of the construction of a system of intercepting and outlet sewers.

D. — Charge of the engineering work in connection with the parks.

E. — Charge of the engineering work, except for Sewer Division, in connection with the Street Department.

The expenses incurred under the head "C" are paid wholly from a special appropriation.

A.

The following is a statement of engineering expenses from Feb. 1, 1896, to Jan. 31, 1897:

Amount of department appropriation for 1896–97	$73,000 00
Amount expended from department appropriation for 1896–97	71,049 99
Unexpended balance	$1,950 01

Statement of Expenditures, Department Appropriation.

Object of expenditures:	
Salaries of City Engineer, assistants, draughtsmen, transitmen, levellers, rodmen, etc.	$64,060 34
Engineering instruments and repairs of same	983 11
Drawing-paper, and all materials for making plans	1,046 18
Stationery, printing-stock, note-books, postage, etc.	978 76
Printing	416 19
Reference library, binding books, and photographs of works	569 15
Travelling expenses (including horse-keeping, repairs on vehicles, etc.)	1,657 93
Telephone service	247 80
Furniture cases for plans and books, etc.	183 19
Blue-process printing	371 23
Incidental expenses, and all other small supplies	536 11
Total	$71,049 99

IMPROVED SEWERAGE.

Total appropriations	$6,375,404 96

Statement of expenses from Feb. 1, 1896, to Feb. 1, 1897.

Object of expenditure:	
General office expenses	$1,763 57
East Shaft Roadway	575 00
Section 6, Dorchester Intercepting Sewer	150 00
" 7 " " "	60 17
" 11 " " "	1,350 00
Mt. Vernon street, Overflow	12,821 62
Neponset Intercepting Sewer	17,422 52
	$34,142 88

Loans negotiated (less $67,500, transferred)	$6,308,664 03	
Revenue	66,740 93	
		$6,375,404 96
Expended previous to Feb. 1, 1896	$6,341,262 08	
Expended from Feb. 1, 1896, to Feb. 1, 1897	34,142 88	
		$6,375,404 96

IMPROVED SEWERAGE CONSTRUCTION, 1896.

Tables showing the cost of the sewer sections in progress during the year 1896, and other miscellaneous work:

General Office Expenses.

Items of expenditure:	
Salaries	$1,618 27
Engineering instruments and repairs	14 17
Stationery and printing stock	19 04
Travelling expenses	76 10
Sundries	35 99
	$1,763 57

EAST SHAFT ROADWAY.

Item of expenditure:	
Displacement of tide-water (Commonwealth of Massachusetts)	$575 00
	$575 00
Expended previous to 1896	5,597 54
	$6,172 54

SECTION 6, DORCHESTER INTERCEPTING SEWER.

Item of expenditure:	
John McShean, damages to land during construction	$150 00
	$150 00
Expended previous to 1896	45,581 76
	$45,731 76

SECTION 7, DORCHESTER INTERCEPTING SEWER.

Item of expenditure:	
Labor	$60 17
	$60 17
Expended previous to 1896	37,703 89
	$37,764 06

SECTION 11, DORCHESTER INTERCEPTING SEWER.

Item of expenditure:	
Land damages, John Durell.	$1,350 00
	$1,350 00
Expended previous to 1896	19,472 81
	$20,822 81

MT. VERNON STREET, OVERFLOW.

Items of expenditure:		
Cement	$307 41	
Lumber	2,933 53	
Piles and labor on same	375 48	
Teaming	100 00	
General supplies	530 40	
Wooden gates	130 29	
Labor	6,985 22	
Sand and gravel	217 15	
Coal	229 61	
Drain-pipe	4 32	
Brick	692 55	
Hardware	170 00	
Granite stones	145 66	
		$12,821 62

NEPONSET INTERCEPTING SEWER.

Items of expenditure:		
Brick	$521 37	
Cement	534 00	
Coal	194 34	
Drain-pipe	2,100 00	
General supplies	405 41	
Hardware	20 08	
Insurance	75 00	
Labor	10,841 79	
Lumber	127 66	
Sand and gravel	316 25	
Teaming	256 00	
Rent of machinery	974 50	
Paving	985 12	
Granite curbing	50 00	
Rent of land	21 00	
		$17,422 52
Expended previous to 1896		4,473 74
		$21,896 26

ABOLISHMENT OF GRADE CROSSINGS.

Dover-street Bridge.

Expenditures from Feb. 1, 1896, to Feb. 1, 1897.

Displacement of tide-water (Commonwealth of Massachusetts)	$153 75	
Land damages, Lawrence J. Logan	20,475 73	
		$20,629 48
Expended previous to 1896		130,453 32
		$151,082 80

STATUES.

John Boyle O'Reilly Monument.

Appropriation from Phillips Street-fund income		$4,250 00
Items of expenditure:		
Labor	$204 86	
Stone pavement	405 00	
	$609 86	
Expended previous to 1896	3,357 39	
		3,967 25
Balance Feb. 1, 1897		$282 75

Robert G. Shaw Monument.

Appropriation, Robert G. Shaw monument,	$19,500 00
No expenditures during the year ending Feb. 1, 1897.	
Expended previous to 1896	11,928 40
Balance Feb. 1, 1897	$1,976 11

SOUTH UNION STATION.

Items of expenditure by the Engineering Department from July 1, 1896, to Feb. 1, 1897:

Boat	$47 50	
Borings, rent of machinery	270 50	
" labor	1,106 28	
Engineering	3,030 00	
Rent of office	125 00	
Sundries	64 81	
		$4,644 09

BRIDGES.

The annual inspection of all highway and foot-bridges has been made, together with special examinations and inspections when notified by the Superintendent of Streets of the progress of repairs.

Two bridges, Centre-street bridge and Roxbury Crossing foot bridge, have been abolished during the year, on account of the raising of the tracks of the Providence Division of the N. Y., N. H. & H. R.R.

In the list of bridges those marked with a star (*) are over navigable waters, and are each provided with a draw, the openings in which are shown in a table in Appendix A. The widths of the openings have been measured for this report.

I. — BRIDGES WHOLLY SUPPORTED BY BOSTON.

Agassiz bridge, in Back Bay Fens.

Allston bridge, over Boston & Albany Railroad, Brighton.

Arborway bridge, over Stony brook.

Ashland street, over Providence Division, N. Y., N. H. & H. R.R., West Roxbury.

Athens street, over New England Railroad.

Audubon road, over Boston & Albany Railroad.

Beacon street, over outlet to Back Bay Fens.

Beacon street, over Boston & Albany Railroad.

Berkeley street, over Boston & Albany Railroad.

Berkeley street, over Providence Division, N. Y., N. H. & H. R.R.

Bernier-street foot-bridge (in the Riverway).

Berwick-park foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.

Blakemore street, over Providence Division, N. Y., N. H. & H. R.R.

Bolton street, over New England Railroad.

Boylston street, in Back Bay Fens.

Boylston street, over Boston & Albany Railroad.

Bridle path in the Riverway, over Muddy river.

*Broadway, over Fort Point channel.

Broadway, over Boston & Albany Railroad.

Brookline avenue, over Boston & Albany Railroad.

Byron street, over Boston, Revere Beach & Lynn Railroad.

*Castle-island foot-bridge, from Marine park, South Boston, to Castle island.

*Charles river, from Boston to Charlestown.
Charlesgate, Back Bay Fens, over Boston & Albany Railroad.
*Chelsea, South, over South channel of Mystic river.
*Chelsea street, from East Boston to Chelsea.
Circuit drive, over Scarboro' pond in Franklin park.
Columbus avenue, over Boston & Albany Railroad.
*Commercial point, or Tenean, Dorchester.
Commonwealth avenue, in Back Bay Fens.
*Congress street, over Fort Point channel.
Cornwall street, over Stony brook, West Roxbury.
Cottage Farm bridge, Brighton.
Cottage-street foot-bridge, over flats, East Boston.
Dartmouth street, over Boston & Albany Railroad and Providence Division, N. Y., N. H. & H. R.R.
*Dover street, over Fort Point channel.
Ellicott arch, in Franklin park.
*Federal street, over Fort Point channel.
Fen bridge, Back Bay Fens.
Ferdinand street, over Boston & Albany Railroad.
Forest Hills entrance, in Franklin park.
Gold street, over New England Railroad.
Huntington avenue, over Boston & Albany Railroad.
Irvington-street foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.
*L street, over Reserved channel, South Boston.
Leverett-pond foot-bridge, in Leverett park.
Leyden street, over Boston, Revere Beach & Lynn Railroad.
Linden Park street, over Stony brook.
*Malden, from Charlestown to Everett.
Massachusetts avenue, over Boston & Albany Railroad.
Massachusetts avenue, over Providence Division, N. Y. N. H. & H. R.R.
*Meridian street, from East Boston to Chelsea.
*Mount Washington, over Fort Point channel.
Neptune road, over Boston, Revere Beach & Lynn Railroad.
Newton street, over Providence Division, N. Y., N. H. & H. R.R.
Public Garden, foot-bridge.
Scarboro' pond foot-bridge, in Franklin park.
Shawmut avenue, over Boston & Albany Railroad.
Stony brook, Back Bay Fens.
Swett street, east of New England Railroad.

Swett street, west of New England Railroad.
*Warren, Boston to Charlestown.
West Rutland square foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.
Winthrop, from Breed's island to Winthrop.

II.— BRIDGES OF WHICH BOSTON SUPPORTS THE PART WITHIN ITS LIMITS.

Bellevue street, in the Riverway, over Muddy river.
Bernier-street foot-bridge, in the Riverway, over Muddy river.
Brookline avenue, in the Riverway, over Muddy river.
*Cambridge street, from Brighton to Cambridge.
Central avenue, from Dorchester to Milton.
*Chelsea, North, over North Channel, Mystic river.
*Essex street, from Brighton to Cambridge.
*Granite, from Dorchester to Milton.
Longwood avenue, from Roxbury to Brookline.
Mattapan, from Dorchester to Milton.
Milton, from Dorchester to Milton.
*Neponset, from Dorchester to Quincy.
*North Beacon street, from Brighton to Watertown.
*North Harvard street, from Brighton to Cambridge.
Spring street, from West Roxbury to Dedham.
Tremont street, in the Riverway, over Muddy river.
*Western avenue, from Brighton to Cambridge.
*Western avenue, from Brighton to Watertown.

III.— BRIDGES OF WHICH BOSTON PAYS A PART OF THE COST OF MAINTENANCE.

Albany street, over Boston & Albany Railroad.
*Canal, from Boston to Cambridge.
Chelsea bridge, over the Boston & Maine Railroad.
Dorchester street, over Old Colony Division, N. Y., N. H. & H. R.R.
Everett street, over Boston & Albany Railroad, Brighton.
*Harvard, from Boston to Cambridge.
*Prison Point, Charlestown to Cambridge.
*West Boston, from Boston to Cambridge.
West Fourth street, over Old Colony Division, N. Y., N. H. & H. R.R.

IV.— Bridges supported by Railroad Corporations.

1st. — Boston & Albany Railroad.

Harrison avenue.
Market street, Brighton.
Tremont street.
Washington street.

2d. — Boston & Maine Railroad, Western Division.

Main street.
Mystic avenue.

3d. — Boston & Maine, Eastern Division.

Main street.
Mystic avenue.

4th. — Boston, Revere Beach & Lynn Railroad.

Everett street.

5th. — New England Railroad.

Broadway.
Dorchester avenue.
Fifth street.
Fourth street.
Harvard street, Dorchester.
Morton street, Dorchester.
Norfolk street, Dorchester.
Norfolk street, Dorchester.
Second street.
Silver street.
Sixth street.
Third street.
Washington street, Dorchester.

6th. — New York, New Haven & Hartford Railroad, Old Colony Division.

Adams street.
Ashmont street and Dorchester avenue.
Cedar Grove Cemetery.
Freeport street.
Savin Hill avenue.

7th. — N. Y., N. H. & H. R.R., Providence Division.

Beech street, West Roxbury.
Bellevue street, West Roxbury.
Canterbury street, West Roxbury.
Centre and Mt. Vernon streets.
Dudley avenue.
Park street.

Recapitulation of Bridges.

I.	Number wholly supported by Boston . .	64
II.	Number of which Boston supports that part within its limits	18
III.	Number of which Boston pays a part of the cost of maintenance	9
IV.	Number supported by railroad corporations:	
1.	Boston & Albany	4
2.	Boston & Maine, Western Division . . .	2
3.	Boston & Maine, Eastern Division . . .	2
4.	Boston, Revere Beach & Lynn Railroad . .	1
5.	New England Railroad	13
6.	N. Y., N. H. & H. R.R., Old Colony Division .	5
7.	N. Y., N. H. & H. R.R., Providence Division .	6
	Total	124

Agassiz-road Bridge (in Back Bay Fens).

This bridge was built in 1887, of brick and stone masonry. It is maintained by the Park Department, and is in good condition.

Albany-street Bridge (over the Boston & Albany R.R.).

The original structure was built in 1856–57 and rebuilt in 1867–68. The present bridge was built in 1886–87, and is maintained in part by the City of Boston, and in part by the Boston & Albany Railroad. During the past year all the ironwork of the bridge has been cleaned and painted, and about one-half of the under-planking has been renewed. The work of cleaning and painting was done in a satisfactory manner, excepting the under side of the lower flange of the floor beams over the main tracks. On account of the difficulty of doing this work, except from the railroad tracks, the painting was either omitted entirely or so poorly done as to be of little value.

Allston Bridge (over the Boston & Albany R.R., Brighton).

This is an iron bridge, built in 1892. The recommendation made last year that the floor be painted is renewed this year.

Arborway Bridge (over Stony Brook, in Parkway, near Forest Hills Station).

This is a wooden bridge resting on abutments of vulcanized spruce piles. The stringers and under-planking are of vulcanized hard-pine. It was built in 1893, and is maintained by the Park Department.

Ashland-street Bridge (over Providence Division, N. Y., N. H. & H. R.R., West Roxbury).

The present structure is of iron, and was built in 1875. The ironwork is in good condition, but the wooden fences are very poor, and should be rebuilt at once.

Athens-street Bridge (over New England R.R.).

This is an iron bridge, built in 1874. The bridge is in poor condition; it should be stripped and painted, and the upper woodwork should be renewed.

Audubon-road Bridge (over the Boston & Albany R.R.).

This is a steel-plate girder bridge, built in 1893–94, and is now in good condition. It is maintained by the Park Department.

Beacon-street Bridge (over Outlet of Back Bay).

This is an iron bridge, built in 1880–81. It is in fair condition.

Beacon-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1884–85, widened in 1887–88, and the central roadway further widened in 1890 for the convenience and at the expense of the West End Street Railway Company. The ironwork of this bridge below the flooring is very rusty and the lower planking is rotten in places. It is recommended that the flooring be taken off and the ironwork cleaned and painted this year.

Bellevue-street Bridge (over Muddy River, in the Parkway).

This is a segmental masonry arch of 44 feet span and 15 feet rise. It was built in 1893 by the Park Departments of Boston and Brookline, and is maintained jointly by them.

Berkeley-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1891, and is now in good condition. During the past year the portion of this bridge above the floor has been painted with the exception of the outside of the outer girders. There is no apparent reason why this small amount of painting was omitted. No permanent railing has as yet been built at the north-easterly corner of the bridge, and the existing fence cannot be considered a satisfactory protection.

Berkeley-street Bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This bridge has been reported for a number of years to be in a bad condition, and only such repairs as seemed absolutely necessary have been made. By continuing this policy, it is probable that this bridge can be made to last until the changes incident to the new southern railroad terminal render a bridge at this point unnecessary.

Bernier-street Foot-bridge (over Bridle Path in Riverway).

This is a semicircular masonry arch of 38 feet 4 inches span. It was built in 1893, and is maintained by the Park Department.

Bernier-street Foot-bridge (over Muddy River).

This is a segmental masonry arch of 52 feet span and 14 feet rise. It was built in 1893 by the Park Departments of Boston and Brookline, and is maintained jointly by them.

Berwick-park Foot-bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron foot-bridge, erected in 1894. The iron stairs and piers were new, but the trusses and floor-beams were those built for Franklin street in 1883. It has been painted during the year and is in good condition.

Blakemore-street Bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron bridge, built in 1881–82. It should be painted and the woodwork repaired.

Bolton-street Bridge (over New England R.R.).

This is a wooden bridge, built in 1889. The sidewalks and deck should be renewed and the fences should be repaired and painted.

Boylston-street Arch Bridge (in Back Bay Fens).

This is a stone arch bridge, built in 1881. It is in good condition.

Boylston-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1886–88. It is now in good condition.

Bridle-path Bridge, in the Riverway (over Muddy River).

This is a masonry bridge of three arches; the central arch is elliptical in form, with a span of 30 feet and a rise of 9 feet 6 inches; the side arches are semicircular, 15 feet in diameter. It was built in 1894 and is maintained by the Park Department. It is in good condition.

Broadway Bridge (over Fort Point Channel).

This is an iron bridge. It was built in 1869–71, and the draw and its foundation were rebuilt in 1874–75. The bridge was temporarily strengthened in 1893, to allow electric cars to use it. The woodwork on the draw has been renewed, the lower part of the draw and the iron columns under the centre of the draw have been painted, repairs have been made on the deck of the bridge and the draw pier, and other general work has been done.

The sidewalks and the lower planking on the main bridge and on the Foundry-street span need repairs, and the draw foundation should be pointed. The piers and fender-guards need renewal. The draw and draw foundation are in good condition.

Broadway Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1880–81. An examination of this bridge was made in October, 1895, in consequence of which a report was sent to the Street Department recommending that the ironwork below the floor be painted at once. Nothing, however, has been done as yet toward carrying out this recommendation. If this bridge is to be kept in service after the new railroad terminals are completed, the ironwork under the floor should be cleaned and painted without further delay. The fence on this bridge is in poor condition, and should be repaired as recommended in the reports for the past two years.

Brookline-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1884. It is now in good condition.

Brookline-avenue Bridge (over Muddy River, in the Riverway).

This is a semicircular masonry arch of 15 feet span. It was built in 1892 by the Park Departments of Boston and Brookline, and is maintained by them jointly.

Byron-street Bridge (over Boston, Revere Beach & Lynn R.R.).

This is a wooden bridge, built in 1889. A new spruce deck has been put on the bridge. The sidewalk and bulkheads need repairing, and the fence should be painted.

Cambridge-street Bridge (from Brighton to Cambridge).

This is a wooden pile bridge, with a wooden leaf draw. The city maintains the part within its limits. It was rebuilt in 1884; the draw was rebuilt in 1891. The draw pier is too short to accommodate the larger class of vessels that the widening of the draw-way allows to pass through the bridge. A new boat, a buoy, and a better house should be provided at this bridge; the fender-guard, pier, water-way and stone abutment need repairing. The deck of the bridge is old and needs repairing.

Canal or Craigie's Bridge.

This is a wooden pile bridge, with a wooden turn-table draw. The city pays one-half the cost of maintenance. The

bridge was originally built in 1808, was rebuilt in 1852, and again rebuilt and widened in 1874. The bridge is in the care of a commission, consisting of one commissioner from Boston and one from Cambridge. The down-stream wing on the water-way has been rebuilt with new piles and plank; the down-stream end of the draw-pier has been strengthened and minor repairs have been made. The sidewalks, sidewalk bulkheads and fencing are poor and need rebuilding in part; additional stringers are needed near the draw, and some pile work is needed at the Cambridge end; the roadway should be repaved; the draw is old and needs extensive repairs.

Castle-Island foot-bridge (from Marine Park to Castle Island).

This is a temporary foot-bridge, built in 1892, and is maintained by the Park Department. It connects the Marine park with Castle Island, and is furnished with a draw, so that if desired by the United States authorities, the island can be cut off from the shore. The fences have been painted; the draw should be adjusted, and minor repairs are needed on the flooring; otherwise the bridge is in good condition.

Central-avenue Bridge (over Neponset River, Dorchester Lower Mills).

This is an iron bridge, and was built in 1876. The city maintains the part within its limits. The woodwork of this bridge is in very poor condition, and the previous recommendation is repeated that the bridge be stripped and painted, the woodwork renewed, and the abutment pointed.

Charles-river Bridge (from Boston to Charlestown).

This is a wooden pile bridge, with an iron draw. The present bridge was built in 1854–55; the draw was built in 1870. The fence at the Boston end of the bridge needs repairing, and the paving on the roadway is poor; otherwise the main bridge is in fair condition; the piers and the fender-guard are in very poor condition.

Charlesgate (in Back Bay Fens, over Boston & Albany R.R.).

This is an iron bridge, built in 1881–82, and is maintained by the Park Department. It is in good condition.

Chelsea Bridge (over Boston & Maine R.R.).

This is an iron bridge, built by the Boston & Maine Railroad Company in 1894, and is over the railroad location. The surface of the bridge is maintained by the city; the remainder by the railroad company. It is in good condition.

Chelsea Bridge North (over North Channel Mystic River).

The city maintains the part within its limits. The original structure was built in 1802–3. The piles under the main bridge were driven in 1880. The upper part of the bridge, the draw and draw foundation were built in 1895.

The old fender-guard is in poor condition. The draw should be painted, the concrete walk resurfaced, and the water-way on the piers should be repaired.

Chelsea Bridge South (over South Channel, Mystic River).

This is a pile bridge, with an iron draw. The original bridge was built in 1802–3. The piles of the present bridge were driven, and the draw was built in 1877. That part of the bridge above the girder caps was rebuilt at a higher grade, and the draw was raised in 1895. The iron fence near the house needs painting, and the fender-guards are in poor condition; otherwise the bridge is in good condition.

Chelsea-street Bridge (from East Boston to Chelsea).

This is a wooden pile bridge, with an iron swing draw; the original bridge was built in 1834; was rebuilt in 1848, 1873, and again in 1894–95. The bridge should be painted, and the curbs need to be aligned; otherwise the bridge is in good condition.

Circuit-drive Bridge (over Scarboro' Pond, in Franklin Park).

This is an elliptical masonry arch of 30 feet span and 6 feet 3 inches rise. It was built in 1893, and is maintained by the Park Department.

Columbus-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1876–77. The ironwork below the floor is very rusty and should be thoroughly cleaned and painted.

Commercial Point or Tenean Bridge (Dorchester).

This is a wooden pile bridge, with a wooden leaf draw. The present bridge was built in 1875. The draw is old and should be rebuilt; and the draw machinery should be repaired. The bulkhead at the Boston end is in a dangerous condition.

Commonwealth-avenue Bridge (in Back Bay Fens).

This is an iron bridge. It was built in 1881–82, and is in good condition.

Congress-street Bridge (over Fort Point Channel).

This is a wooden pile bridge, with an iron turn-table draw on a stone foundation, and was built in 1874–75. The deck of the bridge and the sidewalks have been repaired in places; the fence and drawhouse have been painted, and the machinery has been repaired. The sidewalks and parts of the flooring of the bridge are in very poor condition and need immediate repairs. The draw should be raised in order to relieve the excessive wear on the wheels and tracks; the paving should be repaired and the top of pier should be rebuilt. The bridge will soon be widened 20 feet at the Boston end, and filled solid as far as the harbor line; as soon as Summer-street bridge is built, which will probably be in about eighteen months, this bridge should be rebuilt; in the meantime it should be watched very carefully.

Cornwall-street Bridge (over Stony Brook, West Roxbury).

This is a small wooden bridge, built in 1892. It is in good condition.

Cottage Farm Bridge (over B. & A. R.R., Brighton).

This is a steel bridge, built in 1895–96. (See page 145.)

Cottage-street Foot-bridge (over Flats, East Boston).

This is a wooden pile bridge, built in 1889, for foot travel only. Some of the piles are commencing to decay; several pieces of cross bracing have been carried off by the ice, and should be replaced; others that are soft and split at the ends should be refastened or replaced. The flooring is poor in a number of places and should be patched, and the fence rails, near the ends of the bridge, should be renewed; otherwise the bridge is in good condition.

Dartmouth-street Bridge (over B. & A. R.R. and Providence Division, N. Y., N. H. & H. R.R.).

This is an iron bridge, built in 1878–79. It should be stripped and thoroughly cleaned and painted this year. The underplanking is poor and should be renewed. The network of wires which disfigure the bridge should be taken down.

Dorchester-street Bridge (over Old Colony Division, N. Y., N. H. & H. R.R.).

This is an iron bridge, built in 1869. It is principally maintained by the railroad company, and was repaired and put in fair condition in 1893. During the past year a 16-in. water pipe was placed under the southerly sidewalk and all iron work exposed at the time, was cleaned and painted.

Dover-street Bridge (over Fort Point Channel).

This was originally a wooden pile bridge, built in 1805, rebuilt in 1858–59, and again in 1876. In 1893–94, upon the abolition of the grade crossing of the Old Colony Railroad, the present iron structure resting on masonry piers was built. The bridge is in good condition. Portions of the foundation of the old draw on the Boston side were allowed to remain at the time the present bridge was built, and they present a very unsightly appearance and should be removed.

Ellicott-Arch Bridge (in Franklin Park).

This is a semicircular masonry arch of 17 feet 6 inches span. It was built in 1889, and is maintained by the Park Department.

Essex-street Bridge (from Brighton to Cambridge).

The city maintains the part within its limits. This is a wooden pile bridge, with a wooden leaf draw, and was originally built in 1850; the draw was rebuilt in 1891. The main bridge has been rebuilt above the piles. (See p. 146.)

Everett-street Bridge (over B. & A. R.R., Brighton).

This is an iron bridge built in 1891 by the Boston & Albany railroad. It is in good condition and needs only minor repairs to some of the woodwork.

Federal-street Bridge (over Fort Point Channel).

This is a wooden pile bridge, with a double retractile iron draw, and was rebuilt in 1891–92. The drawhouse has been painted, and general repairs have been made. The sidewalks need repairing and the fence needs painting; otherwise it is in good condition.

Fen Bridge (in Back Bay Fens).

This bridge was built in 1891–92. It is in good condition.

Ferdinand-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1892. The lower planking is poor, should be renewed and the iron work below the floor cleaned and painted.

Forest Hills Entrance Bridge (in Franklin Park).

This bridge was built in 1894–95. It is maintained by the Park Department and is in good condition.

Gold-street Bridge (over New England R.R.).

This bridge was built in 1895, replacing a foot-bridge which was built in 1890. The bridge is not open to travel as the ramps have not yet been built; the fence is already daubed and cut, and the bridge is dirty and should be cleaned. The outside girders should be painted; the walls need a little pointing.

Granite Bridge (from Dorchester to Milton).

This is a wooden pile bridge, with a wooden leaf draw. The city maintains the part within its limits. The bridge was originally built in 1837. The sidewalk and the up-river pier need replanking; the abutment should be repaired and the fence on the draw should be painted and the flap-hinge should be relocated.

Harvard Bridge (from Boston to Cambridge).

This is an iron bridge with an iron turn-table draw, and was built in 1887–91. The bridge is in the care of two Commissioners, one appointed from Boston and one from Cambridge, and the expense of maintenance is borne equally by each city. The roadway has been sheathed during the

past year, and one-half of the asphalt sidewalk has been renewed by the Contractor who originally put it down, in compliance with his guarantee. The Contractor who put down the other half of the sidewalk should be required to make his work equally good before the time-limit of his guarantee expires. A small amount of painting of the iron work of the bridge has been done during the past year, but until the whole bridge is thoroughly painted it cannot be said to be in first class condition.

Huntington-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge. It was built in 1872, and in 1876–77 the abutments were rebuilt, and the bridge widened by the addition of two new girders. During the past year the flooring of the bridge has been entirely rebuilt and made to conform to the new grade of the street, parapets have been raised and new asphalt sidewalks built. The old girder on the centre line of the westerly sidewalk was moved to the easterly sidewalk and two new plate girders put in under the westerly sidewalk. This change was made necessary because of the new 42-inch water-pipe which was carried across the bridge on this side. The new girders were built by the Boston Bridge Works, under a contract dated Nov. 9, 1895, and the work of moving the old girder was done by the same company; the total cost being $2,646.99. The contract for the woodwork and for changes in stonework was made with W. L. Miller, dated April 11, 1896, and amounted to $4,358. The new sidewalks were built by the Boston Asphalt Company at a cost of $635.25. The cleaning and painting of the girders was done by the Bridge Division of the Street Department.

Irvington street Foot-bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron foot-bridge, built in 1892. It has been painted during the past year and is now in good condition.

L-street Bridge (over Reserved Channel, South Boston).

This is a wooden pile bridge, with an iron retractile draw. It was built in 1892. The interior of the house and a part of the draw beneath the roadway have been painted. The entire bridge should be painted during the coming season; otherwise it is in good condition.

Leverett-pond Foot-bridge (in Leverett Park).

This is a segmental masonry arch of 24 feet span and 5 feet 5 inches rise. It was built in 1894, and is maintained by the Park Department.

Leyden-street Bridge (over Boston, Revere Beach & Lynn R.R.).

There is an iron bridge, built in 1889. The flooring of the roadway and sidewalks needs renewing, and the bridge should be painted.

Linden Park-street Bridge (over Stony Brook).

This is a wooden bridge, built in 1887. The sidewalk planking is very thin and should be renewed, and the entire bridge painted.

Longwood-avenue Bridge (from Roxbury to Brookline).

This is a wooden bridge, supported by wooden posts, and was built in 1877. The portion of the bridge maintained by the City of Boston is not in a safe condition, the underplanking is so rotten that the strength of the floor depends almost entirely on the condition of the sheathing. This bridge should be closed to team travel or restricted to very light loads.*

Malden Bridge (from Charlestown to Everett).

The present structure was built in 1875, and the draw in 1892. Only general repairs have been made. The bridge is in poor condition, and should be rebuilt.

Massachusetts-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1876. It was thoroughly repaired in 1893, with the exception of the wooden fences. These fences are now in very poor condition and should be rebuilt. The bridge will then be in good condition throughout.

Massachusetts-avenue Bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron bridge, built in 1876. It has been painted during the past year and is now in good condition.

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* This bridge was closed to travel, April 22, 1897.

Mattapan Bridge (from Dorchester to Milton).

The city maintains the part within its limits. This is an old iron bridge and is in a dangerous condition, and it should be replaced by a stone bridge.

Meridian-street Bridge (from East Boston to Chelsea).

This is a wooden pile bridge, with a wooden turn-table draw on a pile foundation. The original structure was built in 1858. It was rebuilt soon afterwards, and was widened and rebuilt in 1884, excepting the draw, which was built in 1875–76. The chords and fences of the draw have been rebuilt and the deck repaired. The draw is now moved by electricity, and is lighted by incandescent electric lights. The draw and the fences have been painted, the concrete sidewalks resurfaced, and repairs have been made on the fender-guards and water-ways. The draw and its bearings need adjustment. The stringers on the main bridge, near the draw, need strengthening and the water-ways need further repairing. (See page 146.)

Milton Bridge (from Dorchester to Milton).

The city maintains the part within its limits. The original structure is very old. It was widened in 1871–72. The older part of this bridge was built of stone, and the widening is an iron structure on stone columns. The sidewalks need repairs; otherwise the bridge is in fair condition.

Mt. Washington-avenue Bridge (over Fort Point Channel).

This is a wooden pile bridge, with an iron draw. It was built in 1854, and rebuilt in 1870–71; this bridge is in poor condition. It has the only draw of importance in the city that is moved by hand power; the draw-pier is in poor condition and is so low that it is covered with water at every high course of tides. The pavement, concrete sidewalks, sidewalk flooring on the draw and the fender-guards are in poor condition and need early attention. The water-ways are out of repair, and the draw should be adjusted so it can be reversed. This bridge should be rebuilt; as the building of Dorchester avenue extension will necessitate the rebuilding of part of it, the opportunity should be taken of rebuilding the whole bridge.

Neponset Bridge (from Dorchester to Quincy).

The city maintains the part within its limits. The original structure was built in 1802, and the present one in 1877. The draw is too heavy to be handled by hand, and should be replaced by a turn-table draw. A new sidewalk was built last year. The arrangement of the rails and trolley wires on the draw for the street cars is very poor and should be remedied at once, and the cars should not be allowed to shoot across the draw. New oak headers are needed at the ends of the draw and the latches should be repaired; the piers need extensive repairs; the draw should be painted and the machinery adjusted.

Neptune-road Bridge (over Boston, Revere Beach & Lynn R.R.).

This is an iron bridge, built in 1887-88, and is maintained by the Park Department. The bridge is in good condition, except the roadway plank which should be renewed.

Newton-street Bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron bridge, built in 1872. It is in good condition, excepting the concrete sidewalks, which should be resurfaced.

North Beacon-street Bridge (from Brighton to Watertown).

The city maintains the part within its limits. This is a wooden pile bridge, with a wooden leaf draw. The original structure was built in 1822, and the present one in 1884. The flooring on the pier is in poor condition, and the sidewalk plank needs renewal. An old unused telephone pole on the bridge should be removed.

North Harvard-street Bridge (from Brighton to Cambridge).

The city maintains the part within its limits. This bridge was originally built in 1662, and was rebuilt, except the piling, in 1879; the draw was built in 1891. The abutment, piling, roadway plank and fence are in poor condition. The abutment and main bridge should be rebuilt.

Prison Point Bridge (from Charlestown to Cambridge).

The city pays one-half of the cost of maintenance. This bridge was originally built in 1833, and the present structure was built in 1876–77. It is a wooden pile bridge, with an iron leaf draw. The bridge is in the care of commissioners, consisting of one commissioner from Boston and one from Cambridge. It is in poor condition. Only ordinary repairs have been made on the bridge. The draw, machinery, hinges and the woodwork on main bridge near the channel need thorough repairing; the top of the pier and the faces of the water-way also need repairing; this bridge will probably be rebuilt within a couple of years, owing to the abolishing of the grade crossing of the Boston & Maine Railroad.

Public Garden Foot-bridge.

This is an iron bridge. It was built in 1867, and was thoroughly repaired in 1887.

Scarboro' Pond Foot-bridge (in Franklin Park).

This is an elliptical masonry arch of 40 feet span and 8 feet 3 inches rise. It was built in 1893, and is maintained by the Park Department.

Shawmut-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1871. The girders over the main tracks of the railroad are very badly corroded, and unless this portion of the bridge is cleaned and painted very soon it will be impossible to continue heavy traffic over it. The girders on the outer edges of the sidewalks are covered by a cast-iron parapet which has not been removed since the bridge was built; portions of this covering should be removed so that a thorough examination can be made of the condition of the iron in these girders.

Spring-street Bridge (from West Roxbury to Dedham).

This is a stone bridge. The city maintains the part within its limits. It is in good condition.

Stony-brook Bridge (Back Bay Fens).

This is an ornamental brick arched bridge, with stone facings, built in 1891–92, and maintained by the Park Department. It is in good condition.

Swett-street Bridges (over South Bay Sluices).

These are wooden bridges, built in 1875, as temporary structures; they are in poor condition and extensive repairs should be made on them this year.

Tremont-street Bridge (over Muddy River).

This is a semicircular masonry arch of 15 feet span. It was built in 1893, and is maintained by the Park Departments of Boston and Brookline.

Warren Bridge (from Boston to Charlestown).

This is a wooden pile bridge, with a double retractile iron draw. The present structure was built in 1883–84. Two new trucks and twelve new wheels have replaced old ones, and general repairs have been made. The lower planking on the draw needs renewal, the fender guards need rebuilding, the concrete sidewalks need resurfacing, and repairs are needed on the track stringers, water-way, fence, piers, roadway paving and engines.

West Boston Bridge (from Boston to Cambridge).

This bridge is in the care of two commissioners, one from Boston and one from Cambridge. The city pays one-half of the cost of maintenance. This is a wooden pile bridge, with a wooden turn-table draw. The bridge was originally built in 1792–93, was rebuilt in 1854, and repaired in 1871. This is an old, weak bridge, and is in an unsafe condition, and should be rebuilt. This bridge, and Canal and Prison Point bridges are in the care of the same commission, and are kept in usable condition only by constant care. The bridge has been strengthened by driving ninety-two piles and the addition of twelve girder caps and forty-one stringers, and the ordinary repairs have been made.

West Fourth-street Bridge (over Old Colony Division N. Y., N. H. & H. R.R.).

In 1893–94 the grade crossing of the Old Colony Railroad on this street was abolished and an iron bridge built, extending from the end of Dover-street bridge at the South Boston side of Fort Point channel to the easterly line of Foundry street. The bridge is in good condition, except the sheathing of the northerly roadway which should be renewed.

The entire wearing surface of this bridge is covered with spruce plank, and to maintain it in a satisfactory condition it will be necessary to replank it at least once a year. The expense of this work must be borne by the city.

West Rutland-square Foot-bridge (over Providence Division, N. Y., N. H. & H. R.R.).

This is an iron foot-bridge, built in 1882. New stair-treads have been put down and the bridge painted during the past year. The sidewalks in Rutland square at the foot of the stairs have been put in good condition.

Western-avenue Bridge (from Brighton to Cambridge).

The city maintains the part within its limits. The present bridge was built in 1879–80, and the draw in 1891. During the past summer the horse-cars, which were run over this bridge, were superseded by electric cars, necessitating the strengthening of the draw, to which three additional stringers were added. The main bridge should be rebuilt above the stringers; the piling, fender-guard, water-way and draw pier need repairing, and the draw pier needs lengthening and the stringers at the rear of the draw-arms should be screw-bolted to the girder caps.

Western-avenue Bridge (from Brighton to Watertown).

The city maintains the part within its limits. This is a wooden pile bridge, with an iron draw, and was rebuilt in 1892–93. This bridge should be painted, the latches and bearings should be adjusted, and scupper holes should be made in the flooring of the foundation to drain the central portion.

Winthrop Bridge (from Breed's Island to Winthrop).

This is a pile bridge without a draw. It was originally built in 1839; it was rebuilt in 1851, and was extensively repaired in 1870. This is an old bridge, and is only in fair condition; the bulkhead at the Boston end needs repairing; the caps need additional fastenings, and small repairs are needed on the fence and sidewalk.

Bridges Wholly Supported by Railroad Corporations.

The bridges over the Boston & Albany Railroad maintained by that company are in good or fair condition with the exception of that on Washington street. Attention has been

called in the annual reports of this department for several years past, to the unsafe condition of the sidewalk girders of this bridge. It is understood that the railroad company will put in new girders this season. During the past year the bridge on Market street, Brighton, has been stripped and painted, new angle seats for the stringers put on and one new girder substituted for an old one which was badly corroded.

Of the bridges maintained by the N. Y., N. H. & H. R.R., that at Canterbury street has been entirely rebuilt during the year. The bridge now consists of two through plate girders 64 feet 6 inches long over all, and 5 feet deep. The girders are spaced 24 feet apart on centres with two overhanging sidewalks 8 feet wide. The stringers are 4×12 inches hard pine and the planking is a single course of 3-inch hard pine. The bridge on Beech street has been strengthened to allow the street cars to pass over. Two new I-beams, 20 inches deep, have been placed under each line of rails. The bridge on Adams street has a new hard-pine floor, and has been painted.

The Norfolk-street bridge, over the New England Railroad, near Dorchester station, is a narrow bridge, in a dangerous condition; and the bridge on Silver street needs repairing.

SURVEYING DIVISION.

The organization of the Surveying Division for the past year has remained practically the same as when placed in charge of the Street Commissioners, July 1, 1895; the number of employees engaged on the work being substantially unchanged.

Notwithstanding the fact that the number of orders for street lines and grades attended to for builders and contractors is somewhat smaller than for the preceding year, fully as much work has been accomplished, for the volume of work has increased in other directions, principally for the Paving Division of the Street Department. The Superintendent of Streets, early in the season, made the request that all street lines and grades given for the construction of artificial stone sidewalks be tested after the contractor had completed the work, and a report made, certifying that the sidewalk had been laid at the proper grade and on the correct line. This made it necessary for a surveying party to go to the street a second time, practically doing the work over twice. This is considered to be quite important, however, as a number of sidewalks have been found to be constructed at slightly different lines and grades than those originally given. As

13,471 square yards of artificial stone sidewalks have been laid during the year, for which street lines and grades have been given, it is obvious that the increase in this particular line of work has been considerable.

Some of the more important plans for new streets, where accurate surveys of takings and profiles showing proposed grades have been made, are given in the following list, a complete table, classified under the several districts, being given in Appendix C.

Cove street, plan and profile, from Summer street to Kneeland street, 100 feet wide, showing takings from estates, owners' names, grades, etc.

Summer-street extension, plan and profile, from Purchase street to Fort Point channel, 100 feet wide, showing takings from estates, owners' names, grades, etc.

Dorchester-avenue extension, plan and profile, over Federal-street bridge to Summer-street extension, showing takings, grades, etc.

(In making the above plans of streets to be laid out around the new Southern Station it was necessary to survey some forty-eight estates, look up fifty-two titles in the Registry of Deeds, and devote considerable time to the question of grades shown in detail on the several profiles.)

Congress street, from Atlantic avenue to Fort Point channel.

Bulfinch place, from Bowdoin street to Bulfinch street.

Trinity place, from Dartmouth street to St. James avenue.

Peterborough street, from Back Bay Fens to Brookline avenue.

Marginal-street extension, East Boston.

Reservoir lot, Thomas Park, South Boston.

Atherton-street extension, Roxbury.

Ruggles-street extension, Roxbury.

Alexander street, Dorchester.

Fairmount street, Dorchester.

Martin street, West Roxbury.

Tremont street, Brighton, from Oak square to the Newton line.

Brooks-street extension, under the Boston and Albany railroad at Faneuil.

In addition to the above, several correct surveys have been made of estates where the Street Commissioners have taken land for school purposes; the two most important being the

Prince-street lot, showing six estates, and the Chambers-street lot, showing fourteen estates or parts of estates.

A plan, showing nine different estates, lying north of Seaver street, with several blue prints of same, was made for the Park Commissioners.

Among the many approximate plans made during the year may be mentioned those of: —

Charlestown street, showing proposed widening from Causeway street to Haymarket square.

Dorchester-avenue extension, from Congress street, north, to Atlantic avenue.

Rutherford-avenue extension, over Bow street to City square, Charlestown.

Preble street, from Dorchester avenue to East Ninth street, showing proposed widening and extension.

Several plans and profiles were made in connection with the abolishment of the grade crossings at South street, La Grange street and Spring street, West Roxbury.

Plans and profiles of Bowdoin street, between Beacon street and Derne street, of Ashburton place, from Bowdoin street to Somerset street, and of Somerset street, from Beacon street to Howard street, with proposed extension of same to Court street, were made with a view to cutting down the grades of the above three streets.

Several plans, showing the proposed increase in the territory now contained in the market limits, were made for hearings given by the Street Commissioners.

A map, showing the location of all the electric lights in Boston, scale 800 feet to an inch, was made during the month of October; also a plan, scale 200 feet to an inch, with all electric lights located north of Dover and Berkeley streets.

The following table gives the number of arc lights in the different districts: —

Arc Lights.

City Proper: —	In streets . . .	839	
	Charlesbank . . .	13	
	Commonwealth avenue .	39	
		—	891
East Boston: —	In streets . . .	151	
		—	151

(There are 51 posts in Wood Island park but no lamps.)

South Boston : — In streets . . .	224		
Marine Park . .	4		
Castle Island . .	15		
Castle Island bridge .	17		
	——		260
Roxbury : — In streets	351		
Back Bay Fens . . .	45		
Riverway	49		
Leverett park . . .	1		
	——		446
Dorchester : — In streets. . . .	237		
	——		237
Charlestown : — In streets . . .	175		
	——		175
Brighton : — In streets	174		
	——		174
West Roxbury : — In streets . . .	137		
Jamaica Way and Franklin Park . .	72		
	——		209
			2,543

Street lines and grades, both for foundations and finished work, have been given during the year for many prominent buildings, among the more important being: Brazer building, corner of State street and Devonshire street; Steinert Hall, Boylston street, corner of Carver street; Hotel Touraine, corner of Boylston street and Tremont street; Sudbury building, Sudbury street and Hawkins street; Trinity court, on Dartmouth street and Trinity place; the Marlborough, at the corner of Massachusetts avenue and Marlboro' street; Windemere terrace, on Boylston street, near and west of Massachusetts avenue; the Inverness, at the corner of Beacon street and Aberdeen street; and the seven-story building on Bulfinch place, corner of Bulfinch street.

Outside work was continued up to the middle of the month of December. Since that time the several surveying parties have been engaged, making assessment plans for the Street Commissioners, and for the Paving Division of the Street Department, sewer assessment plans, indexing survey and level notes, plots, calculations, etc.

A general index to survey notes, from Jan. 1, 1881, to July 1, 1895, has been prepared during the past year, alphabetically arranged in card catalogue form. This index is now being type written, and when finished will furnish the office with a complete index, contained in four volumes, all survey notes from the establishment of the City Surveyor's office to the time of its consolidation with the Engineering Department.

The following list gives the number of orders attended to for property owners and builders and the various city departments from Feb. 1, 1896, to Feb. 1, 1897.

Street lines given	658
Street grades given	515
Street Department, Paving Division	1,473
Street Department, Sewer Division	288
Buildings Department[1]	4,832
Public Buildings Department	86
Public Grounds Department	6
Law Department	114
Street Commissioners	343
Engineering Department	79
Assessors' Department	2
Lamp Department	2
Park Department	1
Water Department	10
Mayor and City Council	10
	8,419

Five hundred and forty-one blue prints have been made during the year.

[1] The greater part of the orders from the Buildings Department are applications for building and repairing permits that are examined daily in relation to street lines and grades, with a view of preventing encroachments over street lines and the erection of buildings at incorrect grades.

The following table gives the monthly amounts of paving work measured by the Surveying Division of the Engineering Department for the year ending Jan. 31, 1897 : —

1896.	Edgestone. Linear feet.	Block stone. Sq. Yds.	Round stone. Sq. Yds.	Brick sidewalks. Sq. Yds.	Artificial Stone Sidewalks. Sq. Yds.	Asphalt Repairs. Sq. Yds.	Coal Tar Concrete. Sq. Yds.
February					422.9		
May	4,098.1	2,658.2	1,256.5	1,161.8	160.8	163.0	
June	11,408.0	6,618.3	691.2	6,171.8	2,176.4		
July	8,071.5	5,047.2	664.2	3,716.4	2,163.8		
August	13,251.7	8,927.5	1,084.4	5,132.9	1,724.1	210.0	
September	16,089.2	11,915.2	938.5	5,690.1	546.7		
October	15,931.1	9,008.6	4,352.1	16,179.0	2,984.5	20.5	2,971.4
November	33,932.8	14,490.0	8,920.9	19,126.9	1,991.3		
December	15,782.7	5,364.8	6,962.4	10,617.9	1,300.9		
January, 1897	1,592.8	922.3	105.8	381.5			
Totals	120,157.9	64,952.1	24,976.0	68,178.3	13,471.4	393.5	2,971.4

How Street Lines Often Become Irregular.

Every year there are many buildings erected on public streets for which no application is made to this office for lines and grades, contractors and builders frequently assuming the line, and often encroaching into the streets with steps, bays, porticos, etc. The surveyors are constantly watching for such encroachments ; but it sometimes happens that buildings are nearly completed before reports of encroachments are made. It would seem as though some law or an ordinance, should be passed, compelling builders and contractors to apply for street lines and grades before they obtain permission to build.

There are many important streets that have no officially established lines, and that have become public, either through official action of the Selectmen, the Board of Aldermen and the Board of Street Commissioners, or by prescription. In the city proper, north of Dover and Berkeley streets, there are some three hundred and thirty public streets ; about one hundred and fifty of these have no fixed or officially established lines, and fifty have such lines only upon one side or for a part of their length.

The importance of fixed official lines as a result of correct surveys is obvious, when the numerous encroachments of builders and contractors upon the public highways are considered. Such important thoroughfares as Court street, part of Sudbury street, that part of Washington street between Cornhill and Milk street, Hanover street on the north-west side, Portland street on the westerly side, parts of North street, are all instances of streets for which no fixed lines have ever been established.

Lines of occupation by old buildings have been given for the erection of new ones without regard for the uniformity of line for the entire street, and many of the encroachments made by the old structures thus continued. Early in 1875 a book was opened in the office of the City Surveyor for a record of encroachments. Since that time some one hundred and eighty encroachments of buildings, steps, porticos, etc., into the public highways have been entered in it. These are, without doubt, but a small part of what have occurred, merely those that have come to the notice of the employees in the office. It is certain that if these street lines could be definitely fixed, and the builders and contractors compelled by the authority of a statute or an ordinance to obtain them before permits to build are issued, the jogs and irregularities now existing in and defacing many of the public streets would gradually disappear, and before many years the building fronts upon estates would be greatly improved from the resulting regularity. Estate owners as well as the public would benefit by this. Official street lines could be given on any property upon request to the city for them. Frequent delays in the improvement of real estate are caused by the time required to settle upon disputed questions as to the lines of bounding streets. The uncertain standing of many street lines has, undoubtedly, been also a cause of the loss of considerable land in the estimation of areas for purposes of taxation.

Areas of Re-Districted Wards.

Approximate areas of the new wards on lines established by the City Council of 1895 have been computed from the most reliable maps in the office, with the following result: —

AREA OF BOSTON — BY WARDS — IN ACRES.

WARDS.	Land.	Flats.	Water.	Areas to Ward Lines.	Between Ward and Harbor Lines.
1	1,188	163	159	1,510	*384
2	357	58	.....	415	*57
3	332	.....	56	388	**25
4	301	88	78	467	
5	205	.....	11	216	
6	293	.....	.....	293	
7	394	.....	18	412	
8	166	.....	66	232	
9	186	22	79	287	
10	394	.....	.....	394	
11	638	.....	184	822	
12	235	.....	.....	235	
13	604	74	35	713	**6
14	385	449	65	899	**65
15	243	107	.....	350	
16	564	109	.....	673	
17	423	37	.....	460	
18	220	.....	.....	220	
19	760	.....	.....	760	
20	1,716	394	.....	2,110	
21	640	.....	.....	640	
22	760	.....	.....	760	
23	7,615	.....	45	7,660	
24	3,252	136	92	3,480	
25	2,739	.....	116	2,855	
Totals	24,610	1,637	1,004	27,251	345

*Inside of harbor line. **Outside of harbor line.

TRUE MERIDIAN LINE.

Acting under the requirements of chapter 286 of the Acts of 1870, the Board of Aldermen, under date of Nov. 21, 1870, passed an order authorizing the City Surveyor to erect monuments for the purpose of establishing the true meridian line for Suffolk County, and Oct. 2, 1871, directed the City Surveyor to keep in his office a book which should contain a record of the location of said line, and in which all land surveyors should enter, at least once a year, the variations of their compasses and other surveying instruments. A State Commissioner had, under the provisions of section 6 of the aforesaid act, already been appointed, and, after consultation with him, a suitable locality was decided upon, and three granite posts placed on the southerly portion of the parade ground on Boston Common. These posts were placed 200 feet apart; they are eighteen inches square at the base, one foot square at the top, eight feet long, and firmly set in a bed of concrete, with tops just below the surface of the ground, each covered with a North River flagstone, about three feet square, set even with the surface of the ground, and having a hole in the centre of each, so arranged that the top of each post is easily accessible. Covering the top of each post or monument is a piece of metal about eight inches in diameter, on which are cut two fine intersecting lines forming a cross and indicating the four cardinal points marked by the letters N. S. E. W. The line running through these intersection points in the three monuments is the true North and South meridian for Suffolk County.

During the year 1895, owing to the large amount of gravel and other material taken from the subway and placed on the parade ground, it was found impossible to get at these monuments and read the magnetic variations for the several instruments used in this department, and as it was the intention to fill this part of the Common to the extent of several feet, it was feared that these meridian posts would be buried beyond reach.

The matter was called to the attention of the Subway Engineer, and the Transit Commission caused to be built around each monument a brick enclosure from five to seven feet high, large enough to enable a man to descend through a large manhole, thus preserving the posts for the future use of all surveyors of this county.

The several transits now in use in this office have recently been taken to the Common, the magnetic variation read and a record made of the same in the book on file for that pur-

pose in this office. The average variation of the needle for all the instruments in the office is 12° 5′ west from true meridian. A plan, showing in detail the construction of the original monuments, is on file in this office, in Vol. 36, page 157.

Perambulation of Boundary Lines.

Section 3 of chapter 27 of the Public Statutes requires that "There shall be a perambulation of town lines, and they shall be run and the marks renewed, once in every five years, by two or more of the selectmen of each town, or by such substitutes as they in writing appoint for that purpose. After every such renewal the proceedings shall be recorded in the records of the respective towns."

In compliance with the requirements of this act, the Board of Aldermen, under date of Feb. 10, 1896, passed an order authorizing the perambulation of the several boundary lines between Boston and the adjoining cities and towns, and appointed a committee, consisting of three members of the Board the City Clerk, and City Engineer, to attend to the matter. No plan or note book was found recorded that would give the exact location of each bound, the description filed in the City Clerk's office giving only the distances between the monuments and the directions of the lines, so that early in the year and preliminary to the visitation a photograph was made of each stone bound, small maps were prepared, showing the location of every monument; the correct dimensions of all stone bounds, standing above the surface of the ground, were recorded in survey note books, B 439 (Revere); B 448 (Everett and Somerville); B 446 (Newton and Brookline); B 445 (Brookline, Dedham and Hyde Park); B 435 (Hyde Park); and each monument numbered. The photographs and small maps, 132 in all, were prepared in duplicate, and pasted into two books, one of which accompanied the report of the committee, and is filed in the office of the City Clerk, the other in the library of the Engineering Department.

The names of the cities and towns visited, and the date of perambulation is herewith given: Revere, May 20, 1896; Everett, May 20, 1896; Somerville, May 20, 1896; Newton, May 22, 1896; Brookline, May 27, 1896; Dedham, June 3, 1896; Hyde Park, June 3, 1896.

As a matter of record, the following list is given of the work done for the Paving Division of the Street Department, from Feb. 1, 1896, to Feb. 1, 1897: —

City Proper.

Albany street, rear of City Hospital. Measurement of asphalt paving.

Albany street, northerly corner of Massachusetts avenue. Grade for edgestone.

Appleton street, Tremont street to Columbus avenue. Measurement and levels for profile of curb.

Batterymarch street, No. 40. Measurement of sidewalk paving.

Bay State Road, north-easterly corner Granby street. Measurement of sidewalk paving.

Bay State Road, Nos. 7 to 21. Measurement of gutter paving.

Bay State Road, No. 11. Measurement of sidewalk paving and levels to test curb and sidewalk.

Bay State Road, Nos. 58 to 68. Measurement of sidewalk paving.

Beacon street, Massachusetts avenue to Deerfield street. Measurement of edgestone, gutter, sidewalk and crossing paving.

Beacon street, No. 857. Measurement of edgestone and sidewalk paving.

Beacon street, No. 350. Measurement of sidewalk paving.

Berkeley street, westerly corner of Commonwealth avenue. Measurement of edgestone, gutter and sidewalk paving.

Berkeley street, Boylston street to Marlboro' street. Measurement of edgestone, gutter, crossing and sidewalk paving.

Blagden street, southerly side. Measurement of edgestone, gutter and sidewalk paving.

Boylston street, southerly corner Carver street. Measurement of sidewalk paving.

Boylston street, northerly side Berkeley street to Clarendon street. Measurement of edgestone and gutter paving.

Boylston street, southerly side Exeter street to Boston and Albany R.R. Line and grade for edgestone.

Boylston street, Fairfield street to Boston and Albany R.R. Levels on curb and tracks and revised grade for edgestone.

Boylston street, southerly side Dartmouth street to Boston and Albany R.R. Measurement of edgestone, gutter and crossing paving.

Brattle square. Measurement of asphalt paving.

Camden street, northerly corner of Columbus avenue. Line and grade for edgestone.

Causeway street, at Wall street. Measurement of roadway paving.

Charlesgate East, easterly side of Commonwealth avenue to Marlboro' street. Measurement of sidewalk paving.

Chestnut street, Brimmer street to Charles river. Levels to test grade.

Chestnut street, Charles street to Charles river. Measurement and levels for profile of curb, line and grade for edgestone, and measurement of edgestone, roadway, driveways and sidewalk paving.

Clarendon street, Commonwealth avenue to Marlboro' street. Measurement of crossings.

Commonwealth avenue, westerly corner Berkeley street. Measurement of sidewalk paving.

Commonwealth avenue, measurement of sidewalk paving at No. 306.

Commonwealth avenue, north-easterly corner of Charlesgate East. Measurement of sidewalk paving.

Concord square, Tremont street to Columbus avenue. Measurement and levels for profile of curb.

Cooper street. Measurement of asphalt.

Cotting street. Line and grade for edgestone and measurement of edgestone, roadway and sidewalk paving.

Cumberland street, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.

Dartmouth street, westerly side, between Boylston street and Newbury street. Measurement of crossing paving.

Durham street, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.

East Brookline street, Washington street to Harrison avenue. Measurement and levels for profile of curb, line and grade for edgestone, and measurement of edgestone, gutter, crossing and sidewalk paving.

East Dedham street, Washington street to Harrison avenue. Measurement and levels for profile of part of curb, grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

East Lenox street, No. 66. Line and grade for edgestone.

East Lenox street, Nos. 105 and 107. Line and grade for edgestone, levels to test edgestone and sidewalk, and measurement of sidewalk paving.

East Lenox street, north-easterly side Fellows street to Harrison avenue. Line and grade for edgestone.

Endicott street. Measurement of asphalt paving.

Exeter street, at Boylston street. Measurement of curb and gutter paving.

Flagg street. Line and grade for edgestone.
Follen street, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.
Gainsboro' street, Nos. 1 to 21. Measurement of gutter paving.
Garrison street, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.
Garden-court street. Measurement and levels for profile of curb, line and grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.
Granby street, north-easterly corner Bay State road. Measurement of sidewalk paving.
Harrison avenue, south-easterly side, near Dover street. Levels to test curb.
Harrison avenue, at East Dedham street. Measurement of edgestone, roadway and sidewalk paving.
Hancock street, at State House. Measurement of sidewalk paving.
Harcourt street, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.
Harvard street, Washington street to Hudson street. Measurement and levels for profile of curb.
Harvard street, Harrison avenue to Hudson street. Line and grade for edgestone.
Holyoke street. Measurement and levels for profile of curb and grade for edgestone.
Huntington avenue, Nos. 187 to 191. Measurement of sidewalk paving.
Irving street, north-easterly corner Myrtle street. Grade for edgestone.
Irvington street, south-westerly side, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.
Ivanhoe street, at West Brookline street. Measurement of roadway paving.
Kilby street. Measurement of asphalt.
Leverett street, at Cotting street. Measurement of roadway paving.
Marlboro' street, easterly corner Massachusetts avenue. Measurement of edgestone, gutter and sidewalk paving.
Marlboro' street, Massachusetts avenue to Charlesgate East. Measurement of edgestone, gutter and sidewalk paving.
Massachusetts avenue, easterly corner Marlboro' street. Levels on curb and measurement of edgestone, gutter and sidewalk paving.
Massachusetts avenue, at St. Botolph street. Measurement of edgestone, gutter and sidewalk paving.

Merrimac street, northerly corner Travers street. Grade for edgestone.

Mt. Vernon street, north-easterly corner Hancock street. Measurement of sidewalk paving.

Myrtle street, northerly side, between South Russell street and Irving street. Grade for edgestone.

Newbury street, No. 20. Measurement of crossing paving.

Newcomb street, Nos. 10 to 16. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Newcomb street, Washington street to Harrison avenue. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Newland street, at West Brookline street. Measurement of edgestone, roadway and sidewalk paving.

North square, at North street. Measurement of edgestone, roadway and sidewalk paving.

North Bennett street. Measurement of asphalt.

North Grove street, at engine-house. Measurement of paving in yard.

Northampton street, westerly corner Columbus avenue. Line and grade for edgestone.

Pemberton square, No. 56. Measurement of sidewalk paving.

Poplar street. Measurement of asphalt.

Portland street, westerly corner Travers street. Grade for edgestone.

Revere street, West Cedar street to Grove street. Measurement of edgestone, gutter and sidewalk paving.

Reed street, Nos. 20 to 24. Line and grade for edgestone.

Reed street, easterly corner Thorndike street. Line and grade for edgestone, levels to test edgestone and sidewalk, and measurement of sidewalk paving.

St. Botolph street, Nos. 173 to 189. Measurement of sidewalk.

St. Botolph street, Massachusetts avenue to Irvington street. Grade for edgestone, and measurement of edgestone, gutter, crossing and sidewalk paving.

Scotia street, southerly side, at electric station. Line and grade for edgestone.

Shawmut avenue, westerly side, at West Brookline street. Measurement of edgestone, roadway and sidewalk paving.

South Russell street, north-westerly corner Myrtle street. Grade for edgestone.

State street, No. 103. Measurement of sidewalk paving.

Stillman street, Charlestown street to Endicott street. Measurement and levels for profile of curb, line and grade for

edgestone, and measurement of edgestone, roadway and sidewalk paving.

Travers street, north-westerly side, between Portland street and Merrimac street. Grade for edgestone.

Union Park street, Washington street to Harrison avenue. Measurement and levels for profile of curb, and line and grade for edgestone.

Union Park street, southerly side, between Harrison avenue and Albany street. Line and grade for edgestone.

Wall street. Measurement and levels for profile of curb, line and grade for edgestone, and measurement of edgestone, sidewalk and roadway paving.

West Brookline street, Tremont street to Warren avenue. Grade for edgestone and measurement of edgestone, gutter, crossing and sidewalk paving.

West Brookline street, Tremont street to Shawmut avenue. Measurements and levels for profile of part of curb, line and grade for edgestone, and measurement of edgestone, gutter, crossing and sidewalk paving.

West Brookline street, Washington street to Shawmut avenue. Measurement and levels for profile of curb, line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

West Newbury street, near Kenmore street. Measurement of sidewalk paving.

Westland avenue, southerly side. Line and grade for edgestone, and measurement of edgestone and sidewalk paving.

West Newton street, at St. Botolph street. Measurement of edgestone, gutter, sidewalk and crossing paving.

Winter street, westerly corner Winter place. Measurement of sidewalk paving.

Yarmouth street. Measurement and levels for profile of curb, and grade for edgestone.

SOUTH BOSTON.

D street, between West First street and West Third street. Line and grade given for edgestone.

Dove street, between E street and Dorchester street. Line and grade given for resetting edgestone. Edgestone, sidewalk and gutter paving measured.

East Broadway, between L street and M street. Sidewalk measured at Nos. 775 and 777.

East Eighth street, at southerly corner of L street. Line and grade given for edgestone.

East Fifth street, between G street and H street. Line and grade given for edgestone.

East Second street, between O street and P street. Line and grade given for edgestone at Nos. 873 and 875.

East Seventh street, south-easterly corner of L street. Line and grade given for edgestone.

East Seventh street, at westerly corner of L street. Line and grade given for resetting edgestone.

East Third street, between N street and O street. Line and grade given for edgestone.

H street, at westerly corner of East Fifth street. Line and grade given for edgestone.

K street, between East Ninth street and the water. Line and grade given for edgestone at Nos. 216 and 218.

L street, between East Broadway and East Eighth street. Line and grade given for resetting edgestone. Edgestone, sidewalk, gutter repaving and crossing measured.

L street, between East Seventh street and East Eighth street. Line and grade given for edgestone.

Rawson street, between Dorchester avenue and Boston street. Line and grade given for edgestone.

Telegraph street, between Dorchester street and Old Harbor street. Line and grade given for resetting edgestone. Edgestone, sidewalk and gutter repaving measured.

EAST BOSTON (INCLUDING BREED'S ISLAND).

Bennington street, between Prescott street and Chelsea street. Edgestones, sidewalk and roadway repaving measured at No. 268.

Bennington street, from Saratoga street to Walley street. Line and grade given for filling.

Bennington street, between Saratoga street and Walley street. Approximate estimate of filling done.

Blackinton street, at westerly corner of Leyden street. Estimate of amount of edgestone required at the Blackinton School lot.

Blackinton street, between Leyden street and Walley street, at the Blackinton School lot. Line and grade given for edgestone. Edgestone and gutter paving measured.

Bremen street, from Sumner street to Maverick street. Line and grade given for resetting edgestone. Edgestone and sidewalk repaving, and block-stone roadway paving measured.

Byron street, between Saratoga street and Pope street. Edgestone, gutter paving and crosswalk measured.

Chelsea street, between Prescott street and Bennington street. Edgestone, sidewalk and gutter repaving measured.

Falcon street, between Meridian street and Brooks street. Line and grade given for edgestone at Nos. 35 and 37.

Falcon street, between Brooks street and Putnam street. Line and grade given for edgestone at No. 93.

Falcon street, between Brooks street and Putnam street. Line and grade given for edgestone.

Falcon street, between Brooks street and Putnam street. Line and grade given for edgestone at No. 95.

Falcon street, between Brooks street and Putnam street. Line and grade given for edgestone at No. 97.

Falcon street, between Brooks street and Putnam street. Line and grade given for edgestone at Nos. 109 and 111.

Havre street, from Maverick street to Decatur street. Edgestone, sidewalk and gutter repaving measured.

Haynes street, between Orleans street and Marginal street. Line and grade given for edgestone. Edgestone, sidewalk and gutter repaving measured.

Lamson street, between Everett street and Maverick street. Line and grade given for edgestone at Nos. 40 and 42. Edgestone, sidewalk and gutter paving measured.

Lamson street, between Everett street and Maverick street. Estimate of amount of edgestone required at Nos. 40 and 42.

Lewis street, at Sumner street. Crossing measured.

Leyden street, at westerly corner of Blackinton street. Estimate of amount of edgestone required at the Blackinton School lot.

Leyden street, between Blackinton street and Breed street, at the Blackinton School lot. Line and grade given for edgestone. Edgestone, sidewalk, gutter and crossing paving measured.

London street, between Meridian street and Porter street. Line and grade given for edgestone at Nos. 140 to 148. Edgestone, sidewalk and gutter paving measured.

Morris street, between Brooks street and Putnam street. Line and grade given for edgestone at No. 87.

Morris street, between Brooks street and Putnam street. Estimate of amount of edgestone required at No. 87.

Orleans street, between Maverick street and Decatur street. Line and grade given for edgestone. Edgestone and gutter paving measured.

Orleans street, at Everett street. Edgestone, gutter paving and crossing measured.

Paris street, at Nos. 132 and 134. Estimate of amount of edgestone required.

Paris street, between Porter street and Gore street. Line and grade given for edgestone.

Paris street, between Porter street and Gore street. Line and grade given for edgestone at Nos. 132 and 134.

Saratoga street, from Boston, Revere Beach & Lynn R.R. to the Winthrop bridge. Line and grade given for grading.

Saratoga street, from Meridian street to Shelby street. Line and grade given for resetting edgestone. Edgestone, sidewalk, gutter paving and crossings measured.

Sumner street, from Boston & Albany R.R. to Jeffries street. Line and grade given for resetting edgestone. Edgestone, sidewalk, gutter paving and crossings measured.

Walley street, from Bennington street to Leyden street. Line and grade given for filling.

Walley street, between Bennington street and Leyden street. Approximate estimate of amount of filling done.

Webster street, from Boston & Albany R.R. to Jeffries street. Line and grade for resetting edgestone. Edgestone, sidewalk, gutter repaving, block-stone roadway and crossings measured.

Wordsworth street, between Bennington street and Milton street. Line and grade given for grading.

CHARLESTOWN.

Decatur street, Medford street to Bunker Hill street. Line and grade given for resetting edgestone.

Main street, City square to Thompson square. Edgestone, roadway and sidewalk paving measured.

ROXBURY.

Abbotsford street, south-westerly side. Measurement of sidewalk paving, and levels to test curb and sidewalk.

Aberdeen street, easterly corner Beacon street. Line and grade for edgestone.

Adams street, northerly corner Dudley street. Measurement of sidewalk paving.

Albany street, No. 845. Measurement of edgestone and sidewalk paving.

Alleghany street, Nos. 1 and 3. Measurement of edgestone, gutter and sidewalk paving.

Alpine street, south-westerly side, at bend. Grade for edgestone.

Amory street, at School street. Measurement of crossing paving.

Atherton street, No. 50. Line and grade for edgestone. Levels to test edgestone and sidewalk, and measurement of edgestone, gutter and sidewalk paving.

Bainbridge street, at Mayfair street. Measurement of crossing paving.

Bartlett street, westerly corner Washington street. Measurement of edgestone, gutter and sidewalk paving.

Batchelder street, No. 41. Measurement of edgestone, gutter and sidewalk paving.

Bickford street, westerly side, near Centre street. Grade for edgestone, and measurement of edgestone and gutter paving.

Blue Hill avenue, south-easterly corner Ingleside street. Levels to test curb and sidewalk and measurement of sidewalk paving.

Blue Hill avenue, at Maywood street. Measurement of crossing paving.

Blue Hill avenue, north-easterly corner Dove street. Line and grade for edgestone.

Blue Hill avenue, easterly corner Quincy street. Line and grade for edgestone.

Blue Hill avenue, south-westerly side Quincy street to Lawrence avenue. Line and grade for edgestone.

Bower street, Nos. 30, 32 and 36. Measurement of sidewalk paving.

Bromley park, at Bromley street. Measurement of crossing paving.

Cabot street, rear of engine-house. Measurement of edgestone, driveway and sidewalk paving.

Calumet street, No. 88. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Carlisle street, Nos. 7 to 11. Measurement of edgestone, gutter and sidewalk paving.

Cedar street, No. 18 and 20. Measurement of edgestone, gutter and sidewalk paving.

Cedar street, No. 105, to Highland street. Measurement of edgestone, gutter and sidewalk paving.

Cedar street, Nos. 123 to 127. Measurement of edgestone, gutter and sidewalk paving.

Centre street, north-westerly side, near Penryth street. Measurement of edgestone and gutter paving.

Centre street and Creighton street, north-easterly corner. Line and grade for edgestone on circle.

Centre street, No. 354. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.
Centre street, easterly corner Sheridan street. Measurement of edgestone and gutter paving.
Chestnut avenue, Nos. 114 to 118. Measurement of sidewalk paving.
Clarence street, southerly corner George street. Measurement of edgestone and gutter paving.
Cleveland street, Nos. 4 and 6. Measurement of sidewalk paving.
Cobden street, Nos. 3 and 5. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.
Cobden street, No. 15. Measurement of sidewalk paving.
Columbus avenue. Nos. 1077 and 1079. Levels to test curb and sidewalk and measurement of sidewalk paving.
Columbus avenue, Nos. 1120 to 1164. Levels to test curb and sidewalk and measurement of sidewalk paving.
Columbus avenue, north-westerly corner Washington street. Line and grade for edgestone.
Crawford street, No. 102. Measurement of edgestone, gutter and sidewalk paving.
Crawford street, westerly corner Harold street. Line and grade for edgestone and measurement of edgestone and gutter paving.
Crawford street, No. 125. Measurement of edgestone and gutter paving.
Crawford street, No. 126. Measurement of sidewalk paving.
Crawford street, No. 127. Line and grade for edgestone and measurement of edgestone and gutter paving.
Creighton street, north-westerly corner Centre street. Line and grade for edgestone re-marked.
Creighton street, grade for edgestone. Line for edgestone (part way), measurement of edgestone and gutter paving.
Cunard street, No. 31, to Tremont street. Measurement of sidewalk paving.
Dacia street, north-westerly corner Ingleside street. Line and grade for edgestone.
Dacia street, south-westerly corner Dewey street. Line and grade for edgestone.
Dacia street, north-easterly corner Dalmatia street. Line and grade for edgestone.
Dale street, at Regent street. Measurement of crossing paving.
Dalmatia street, No. 43. Line and grade for edgestone.

Dalmatia street, north-easterly corner Dacia street. Line and grade for edgestone.

Day street, easterly side, near Centre street. Measurement of sidewalk paving.

Dean street. Measurement of edgestone, gutter and sidewalk paving.

Dearborn street, northerly corner Dudley street. Measurement of sidewalk paving.

Dennis street, Nos. 14 and 16. Line and grade for edgestone.

Dennis street, Nos. 10 to 18. Measurement of edgestone, gutter and sidewalk paving.

Dewey street, Blue Hill avenue to Dacia street. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Dewey street, No. 33. Measurement of edgestone and gutter paving.

Dimock street, crusher. Approximate estimate of crushed stone.

Dorr street, Nos. 20 and 22. Measurement of edgestone, gutter and sidewalk paving.

Dudley street, northerly corner Dearborn street. Measurement of sidewalk paving.

Dudley street, northerly corner Adams street. Measurement of sidewalk paving.

Dudley street, No. 305. Measurement of sidewalk paving.

Dudley street, Nos. 508 to 514. Measurement of edgestone, crossing and sidewalk paving.

Dudley street, No. 517. Measurement of sidewalk paving.

Elm Hill avenue, No. 36. Measurement of sidewalk paving.

Elmore street, north-easterly side Kensington street to Mayfair street. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Eustis street, Dearborn street to Hampden street. Measurement of edgestone, gutter, crossing and sidewalk paving.

Fairland street, westerly corner Mount Pleasant avenue. Line and grade for edgestone, levels to test edgestone and sidewalk, and measurement of edgestone, gutter and sidewalk paving.

Faxon street, at Smith street. Measurement of edgestone, gutter and sidewalk paving.

Fellows street, East Lenox street to Hunneman street. Measurement and levels for profile of centre of roadway.

Fellows street, northerly corner East Lenox street. Line and grade for edgestone.

Fellows street, Nos. 50 and 52. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Fenno street, easterly corner Rockland street. Line and grade for edgestone.

Fenno street, from Rockland street to Nos. 19 and 20. Measurement of edgestone, gutter and sidewalk paving.

Fenno street, Nos. 16 and 29. Measurement of edgestone, gutter and sidewalk paving.

Fisher avenue, southerly side from Parker street. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Forest street, southerly corner Mount Pleasant avenue. Measurement of edgestone, gutter and sidewalk paving.

Forest street, southerly corner Vine street. Measurement of sidewalk paving.

Forest street, westerly corner Vine street. Measurement of sidewalk paving.

Gaston street, No. 35. Measurement of sidewalk paving.

George street, south-westerly side Clarence street to Langdon street. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Georgia street, No. 49. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Georgia street, No. 39. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Georgia street, northerly corner Warren street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Glenwood street, south-easterly corner Warren street. Line and grade for edgestone, measurement and levels for profile, and measurement of edgestone, gutter, crossing and sidewalk paving.

Harold street, westerly corner Crawford street. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Harold street, Nos. 198 and 202. Measurement of sidewalk paving.

Heath street, easterly corner Parker street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Heath street, No. 107. Measurement of crossing paving.

Heath street, near Schiller street. Measurement of crossing paving.

Heath street, at Day street. Measurement of crossing paving.

Herman street, No. 13. Measurement of edgestone, gutter and sidewalk paving.

Holborn street, Nos. 24 and 26. Measurement of edgestone and sidewalk paving.

Holborn street, No. 32, to Weldon street. Measurement of gutter paving.

Howland street, No. 40. Grade for edgestone and measurement of edgestone and gutter paving.

Howland street, No. 92, to Humboldt avenue. Line and grade for edgestone and crossings, and measurement of edgestone, gutter and sidewalk paving.

Howland street, southerly corner Humboldt avenue. Measurement and levels for profile of curb and gutter.

Howland street, Nos. 42, 82 and 86. Measurement of edgestone, gutter and sidewalk paving.

Howland street, Humboldt avenue to Elm Hill avenue. Measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, easterly side, near Walnut avenue. Grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, Nos. 33 to 37. Measurement of sidewalk paving.

Humboldt avenue, No. 68. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, Nos. 75 and 77. Measurement of sidewalk paving.

Humboldt avenue, at Howland street. Line and grade for crossing.

Hunneman street, Albany street to Harrison avenue. Measurement and levels for profile of centre of roadway.

Hunneman street, Nos. 15 to 19. Line and grade for edgestone.

Hunneman street, Nos. 11 to 19. Measurement of edgestone, gutter and sidewalk paving.

Huntington avenue, westerly corner Wigglesworth street. Measurement and levels for profile of curb.

Hutchings street, southerly side. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Ingleside street, south-easterly corner Blue Hill avenue. Line and grade for edgestone, levels to test edgestone and sidewalk, and measurement of edgestone and sidewalk paving.

Ingleside street, south-westerly corner of Blue Hill avenue. Paving measured.

Ingleside street, No. 20, to Dacia street. Line and grade for edgestone and measurement of edgestone and gutter paving.

Judson street, No. 24. Measurement of edgestone, gutter and sidewalk paving.

Kenney street, crusher. Approximate estimate of crushed stone.

Kensington street, easterly corner Elmore street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Lamartine street, at Roys street. Measurement of crossing paving.

Lambert avenue, No. 64. Measurement of sidewalk paving.

Lamont street, No. 35, to Linden Park street. Measurement of sidewalk paving.

Langdon street, Nos. 25 to 35. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Langdon street, Nos. 13 to 17. Measurement of edgestone, gutter and sidewalk paving.

Lansing street, No. 11. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Linden Park street, at Hampshire street. Measurement of crossing paving.

Linden Park street, Roxbury street to Gay street. Measurement and levels for profile of curb.

Linden Park street, Tremont street to Elmwood street. Levels on curb and grade fixed.

Linden Park street, Tremont street to Roxbury street. Grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Logan street, north-easterly side, near Lambert avenue. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Magazine street, Massachusetts avenue to Norfolk avenue. Line and grade for gutter.

Magazine street, opposite Dunmore street. Measurement of edgestone, gutter and sidewalk paving.

Marcella street, at Vale street. Measurement of crossing paving.

Marcella street, easterly corner Thornton street. Line and grade for edgestone, and measurement of edgestone, sidewalk and gutter paving.

Maywood street, southerly corner Warren street. Levels to test curb and sidewalk and measurement of sidewalk paving.

Maywood street, Nos. 22 and 24. Measurement of sidewalk paving.

Maywood street, No. 24, to Hazel park. Measurement of gutter paving.

Maywood street, Nos. 36, 37, 38 and 39. Measurement of sidewalk paving.

Maywood street, northerly side, near Blue Hill avenue. Measurement of edgestone and gutter paving.

Minden street, Nos. 15 and 17. Measurement of sidewalk paving and levels to test curb and sidewalk.

Minden street, No. 123. Measurement of edgestone, gutter and sidewalk paving.

Moreland street, Nos. 94 and 96. Measurement of sidewalk paving.

Mount Pleasant avenue, westerly corner Fairland street. Grade for edgestone, levels to test curb and sidewalk, and measurement of edgestone, gutter and sidewalk paving.

Mount Pleasant avenue, southerly corner Forest street. Measurement of sidewalk paving.

Munroe street, No. 103. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

New Heath street, southerly corner Parker street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Oakland street, Nos. 15 to 19. Measurement of edgestone, gutter and sidewalk paving.

Parker street, Nos. 49 and 51. Measurement of sidewalk paving.

Parker street, between Heath street and New Heath street. Measurement and levels for profile for revised grade.

Parker street, southerly corner New Heath street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Parker street, easterly corner Heath street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Parker street, at Bromley Park. Measurement of crossing paving.

Phillips street, easterly corner Smith street. Measurement of edgestone and gutter paving.

Pontine street, Nos. 25 and 27. Measurement of edgestone, gutter and sidewalk paving.

Prentiss street, Tremont street to Columbus avenue. Line and grade for edgestone, and measurement of edgestone roadway and sidewalk paving.

Quincy street, at Tupelo street. Measurement of crossing paving.

Quincy street, No. 42. Measurement of edgestone, gutter and sidewalk paving.

Quincy street, easterly corner Blue Hill avenue. Line and grade for edgestone.

Regent street, Nos. 94 to 100. Measurement of edgestone, gutter and sidewalk paving.

Rockland avenue, Nos. 23 and 25. Measurement of sidewalk paving.

Rockland street, Nos. 13 to 19. Measurement of edgestone, gutter and sidewalk paving.

Roxbury street, Washington street to Eliot square. Measurement and levels for profile of curb, grade for edgestone, and measurement of edgestone, gutter, crossing and sidewalk paving.

Roxbury street, northerly side, at and near Linden Park street. Grade for edgestone re-marked.

Roxbury street, at Washington street, westerly corner. Grade for edgestone re-marked and edgestone, roadway and sidewalk paving measured.

Ruggles street, northerly corner Shawmut avenue. Grade for edgestone.

Ruthven street, Nos. 15 to 19. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Ruthven street, No. 78. Measurement of sidewalk paving.

Savin street, Nos. 69 to 83. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Shawmut avenue, northerly corner of Ruggles street. Line and grade for edgestone.

Shawmut avenue, Nos. 723 to 731. Measurement of edgestone, gutter and sidewalk paving.

Smith street, line and grade for edgestone, and measurement of edgestone, gutter, crossing and sidewalk paving.

Southwood street, north-easterly side, between Blue Hill avenue and bend. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Southwood street, south-westerly side, Blue Hill avenue to curve. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Southwood street, north-easterly side, between bends. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Southwood street, Nos. 17 and 21. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Stafford street, Nos. 2, 4 and 11. Measurement of edgestone, gutter and sidewalk paving.

Texas street, Tremont street to bend. Line and grade for edgestone, and measurement of edgestone, roadway, and sidewalk paving.

Texas street, at Stony brook. Measurement of edgestone, roodway and sidewalk paving.

Thornton street, easterly corner Marcella street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Townsend street, north-easterly side, between Washington street and Walnut avenue. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Tremont street, at Cabot street. Measurement of roadway paving.

Tremont street, Nos. 1045 to 1055. Measurement of sidewalk paving.

Tremont street, at Gurney street. Measurement of crossing paving.

Tremont street, south-westerly side, from St. Alphonsus street, south. Measurement of curb and gutter.

Valentine street, and Fulda street, easterly corner. Measurement and levels for profile with regard to change of grade at corner.

Vernon street, northerly side, Cabot street to Haskins street. Measurement of edgestone, gutter, and sidewalk paving.

Vine street, westerly corner Forest street. Measurement of sidewalk paving.

Vine street, southerly corner Forest street. Measurement of sidewalk paving.

Walnut avenue, at Harold street. Measurement of edgestone, gutter and sidewalk paving.

Walnut avenue, Nos. 275 and 279. Line and grade for edgestone, and measurement of edgestone and gutter paving; also levels to test curb and grade marks, revised grade for edgestone, and measurement of edgestone, gutter, and sidewalk paving.

Walnut avenue, Cobden street to School street. Measurement and levels for profile of edgestone.

Walnut avenue, Walnut park to Ruthven street. Measurement of crossing paving.

Walnut avenue, No. 340. Measurement of sidewalk paving.

Ward street, near Phillips street. Measurement of gutter paving.

Warren street, south-westerly corner Washington street. Grade for edgestone, and measurement of edgestone and gutter paving.

Warren street, No. 46. Measurement of edgestone, gutter and sidewalk paving.

Warren street, south-westerly corner Rockland street. Grade for edgestone.

Warren street, Nos. 305 to 315. Measurement of sidewalk paving.

Warren street, southerly corner Maywood street. Measurement of sidewalk paving.

Warren street, No. 380. Measurement of sidewalk paving.

Warren street, Nos. 403 to 417. Measurement of sidewalk paving.

Warwick street, at Weston street. Measurement of edgestone, crossing gutter and sidewalk paving.

Washington street, Dudley street to Eustis street. Measurement of roadway paving.

Washington street, south-westerly corner Warren street. Grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.

Washington street, Nos. 2646 and 2648. Measurement of sidewalk paving.

Washington street, at Westminster avenue. Measurement of crossing paving.

Washington street, Nos. 2946 and 2948. Measurement of sidewalk paving.

Westminster avenue. Measurement of driveway paving.

Westminster street, at Williams street. Measurement of crossing paving.

Weston street, Warwick street to Cabot street. Measurement of edgestone, gutter and sidewalk paving.

Whiting street, Nos. 30 and 32. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Whiting street, No. 34. Line and grade for edgestone.

Whiting street, Nos. 32 to 36. Measurement of edgestone, gutter and sidewalk paving.

Whiting street, Nos. 33 and 35. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Whiting street, north-westerly side, Moreland street to Winthrop street. Line and grade for edgestone.

Whiting street, between Moreland street and Winthrop street, both sides. Measurement of edgestone and gutter paving.

Wigglesworth street, Huntington avenue to Longwood avenue. Grade for macadam.

Wigglesworth street, westerly corner Huntington avenue. Measurement and levels for profile of curb.

Williams street, westerly corner Shawmut avenue. Measurement of edgestone, gutter and sidewalk paving.

Windsor street, Nos. 9 and 11. Measurement of sidewalk paving.

Winslow street. Measurement and levels for profile of curb.

Winthrop street, No. 108, to Blue Hill avenue. Measurement of edgestone required, line and grade for edgestone, and measurement of edgestone and gutter paving.

Winthrop street, Nos. 106 and 108. Measurement of edgestone and gutter paving.

Woodward avenue, Nos. 29 and 31. Measurement of sidewalk paving.

DORCHESTER.

Adams street, westerly side, between Parkman street and Dix street. Line and grade given for edgestone. Edgestone and gutter paving measured.

Adams street, No. 33. Measurement of frontage for edgestone. Line and grade given for edgestone. Edgestone and gutter paving measured.

Alban street, Nos. 31, 37, 45, 63, 65, 82 and 92. Sidewalk measured.

Algonquin street, Nos. 31, 33, 35 and 39. Measurement of frontage for edgestone. Edgestone, gutter and sidewalk paving measured.

Allston street, north-easterly corner Lyndhurst street. Line and grade given for edgestone. Edgestone, gutter and sidewalk paving measured.

Armandine street, Nos. 43, 47, 49, 51, 53, 55, 57, 58, 62, 103 and 105. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Ashmont street, southerly side, west of Adams street. Line and grade given for paving gutters. Paving measured.

Auckland street, at Nos. 22, 24, 26 and 28. Line and grade given for sidewalk. Sidewalk measured.

Barrington street, south-westerly corner Clarkson street. Line and grade for edgestone. Edgestone, gutters and artificial stone measured.

Barrington street, Nos. 101 to 109. Edgestone, gutter and sidewalk paving measured.

Batchelder street, between East Cottage street and Marshfield street. Line and grade given for edgestone in front of estate of Mr. Cullen.

Bellflower street, between Boston street and Dorchester avenue. Edgestone, gutters and sidewalks measured for estimate. Line and grade given for retaining wall. Line and grade given for edgestone. Edgestone and gutters measured.

Bellflower street, Boston street to Dorchester avenue. Line and grade given for filling.

Bellevue street, opposite Trull street. Line and grade given for edgestone. Edgestone and gutter paving measured.

Bicknell street, No. 50. Artificial stone measured.

Bicknell street, at south-westerly corner Bradshaw street. Line and grade given for sidewalks. Sidewalk measured.

Bird street, corner Baker place. Plan for edgestone, A. Walker estate. Line and grade for edgestone. Edgestone, gutter and sidewalk paving measured.

Blue Hill avenue, near River street. Line and grade for edgestone. Edgestone and gutter paving measured.

Bowdoin street, north-westerly corner Draper street. Line and grade for edgestone. Edgestone and gutter paving measured.

Bowdoin avenue, at No. 101. Line and grade for edgestone. Artificial stone sidewalk measured.

Bradlee street, at No. 15. Measurement of frontage.

Bradshaw street, between Bicknell street and Glenway street. Line and grade given for construction. Gutter paving measured.

Brent street, northerly side, west of Carlisle street. Artificial stone sidewalk measured.

Brookford street, No. 46. Line and grade for edgestone. Edgestone, gutter and sidewalk paving measured.

Brookford street, north-easterly corner Howard avenue. Line and grade for edgestone. Edgestone, gutter and sidewalk paving measured.

Centre street, between Washington street and Carlisle street. Line and grade given for construction.

Centre street, Smith estate, near Allston street. Line and grade for edgestone. Edgestone and gutter paving measured.

Chamberlain street. Line and grade given for artificial stone sidewalk.

Charles street, from Ditson street to Geneva avenue. Line and grade given for filling.

Clayton street, at Granger street. Paving measured.

Codman street, ledge. Measurement of dust, screenings and cracked stone, and amount of telford on hand estimated.

Cushing avenue, Nos. 93 and 95. Line and grade for edgestone. Edgestone, artificial stone and gutter paving measured.

Dalmatia street. Measurement of artificial stone at Nos. 4, 6, 8, 10 and 12.

Dalmatia street, No. 43. Line and grade for edgestone.

Danube street, No. 46. Frontage for edgestone. Edgestone and gutter paving measured.

Danube street, easterly side, near Brookford street. Line and grade for edgestone. Edgestone and gutter paving measured.

Dean street, No. 22. Line and grade tested.

Dean street, both sides. Plan for sidewalk. Line and grade for edgestone. Edgestone and gutter paving measured.

Devon street. Measurement of artificial stone paving on both sides of street.

Dewey street, between Blue Hill avenue and Dacia street. Line and grade for edgestone.

Dewey street, No. 32. Line and grade for edgestone.

Ditson street, westerly side, between Charles street and Westville street. Line and grade for artificial stone paving. Line and grade tested. Artificial stone paving measured.

Dorchester avenue, No. 1041. Paving measured.

Dorchester avenue, Nos. 1853 and 1855. Paving measured.

Dorchester avenue, at Savin Hill avenue. Paving measured.

Dorchester avenue, at junction Talbot avenue. Line and grade for edgestone.

Dorchester avenue, south-easterly corner Lonsdale street. Artificial stone sidewalk measured.

Draper court, north-westerly corner Bowdoin street. Line and grade for edgestone. Edgestone and gutter paving measured.

Dudley street, No. 738. Line and grade tested.

Dudley street, at Hudson street. Line and grade for edgestone.

Dudley street, Nos. 668 to 678. Artificial stone sidewalk measured.

Dudley street, south-westerly corner Monadnock street. Artificial stone sidewalk measured.

Eastman street. Grade given for filling.

East Cottage street. Paving measured.

Edison Green, at four corners of Dorchester avenue. Line and grade for edgestone circles. Edgestone and gutter paving measured.

Edson street, Nos. 12, 20, 36, 48, 60 and 72. Line and grade for sidewalk. Edgestone and artificial stone sidewalk paving measured.

Edwin street, Nos. 12, 14, 16 and 18. Line and grade for edgestone. Edgestone and gutter paving measured.

Eldon street, southerly side, near Rosseter street. Line and grade for edgestone. Artificial stone sidewalk measured.

Erie street, south-easterly corner McLellan street. Line and grade for edgestone. Edgestone and gutter paving measured.

Erie street, north-easterly corner Michigan avenue. Edgestone and gutter paving measured.

Erie street, No. 38. Line and grade for edgestone. Edgestone and gutter paving measured.

Erie street, at No. 93, and northerly corner McLellan street. Line and grade for edgestone. Edgestone and gutter paving measured.

Erie street, No. 88. Line and grade for edgestone.

Faulkner street, No. 33. Line and grade for sidewalk. Artificial stone sidewalk measured.

Faulkner street, north-easterly corner Freeman street. Line and grade given for edgestone. Edgestone, artificial stone and gutter paving measured.

Freeport street, from Dorchester avenue to Pleasant street. Line given for edgestone.

Geneva avenue, at corner Leroy street. Line and grade for edgestone. Edgestone, artificial stone and gutter paving measured.

Geneva avenue, near Josephine street. Line and grade given for artificial stone sidewalks. Edgestone and artificial stone paving measured.

Geneva avenue, south-westerly corner Westville street. Line and grade for edgestone. Edgestone and gutter paving measured.

Glenway street, at corner May street. Line and grade for sidewalk. Edgestone, gutter and sidewalk paving measured.

Glenway street, westerly side at Page avenue. Line and grade for artificial stone paving. Artificial stone paving measured.

Glenway street, near Bradshaw street. Line and grade for artificial stone tested. Artificial stone sidewalk paving measured.

Glenway street, near May street. Line and grade for artificial stone sidewalk. Artificial stone sidewalk paving measured.

Hartford street, at Chamblet street. Line and grade for setting edgestone circle.

Hartford street, No. 64. Artificial stone paving measured.

Hartland street, Sydney street to Saxton street. Line and grade for construction.

Hartland street, northerly corner Sydney street. Line and grade for edgestone. Edgestone and gutter paving measured.

Hopestill street, westerly corner Northern avenue. Line and grade for artificial stone paving. Line and grade tested. Artificial stone paving measured.

Howard avenue, opposite Dalkeith street. Line and grade for sidewalk. Line and grade tested. Artificial stone sidewalk, edgestone and gutter paving measured.

Howard avenue, Nos. 256, 258, and 260. Line and grade for sidewalk. Line and grade tested. Edgestone, artificial stone and sidewalk paving measured.

Howard avenue, easterly corner Cunningham street. Line and grade for edgestone. Edgestone, gutter and artificial stone paving measured.

Josephine street, Ditson street to Geneva avenue. Artificial stone paving measured.

Kernwood street, No. 78. Line given for sidewalk. Edgestone and gutter paving measured.

Kernwood street, Nos. 41 to 79. Artificial stone paving measured.

Lawrence avenue, No. 85. Artificial stone paving measured. Line and grade tested.

Leyland street, near East Cottage street. Line and grade for edgestone.

Leyland street, No. 3. Measurement of edgestone and gutter paving.

Lonsdale street, at Dorchester avenue. Line given for setting edgestone corners.

Magnolia street, near Lawrence avenue. Artificial stone paving measured.

Magnolia street, No. 96. Artificial stone paving measured.

Magnolia street, between Half Moon street and Hooper avenue. Line and grade for edgestone corners. Edgestone and artificial stone paving measured.

Mayfield street, between Pleasant street and Bakersfield street. Line and grade for artificial stone sidewalk. Line and grade tested. Edgestone, gutter and artificial stone sidewalk measured.

Marshfield street, between Clifton street and Batchelder street. Line and grade for edgestone. Edgestone and gutter paving measured.

Marshfield street, at Lanbrick estate. Levels taken to test grade of edgestone.

McLellan street, between Erie street and Bradshaw street. Line and grade for construction.

McLellan street, line tested in front of Wales' estate.

Melville avenue, Nos. 18 and 20. Line and grade for sidewalk. Artificial stone sidewalk measured.

Mill street, opposite Everett street. Line and grade for sidewalk. Edgestone and gutter paving measured.

Morton street, easterly side, at Codman street. Line and grade given.

Mt. Vernon street, north-westerly corner Dorchester avenue. Artificial stone sidewalk measured.

Norfolk street, from Morton street to Walk Hill street. Line and grade given for construction.

Northern avenue, between Washington street and Whitfield street. Line and grade for artificial stone sidewalk.

Northern avenue, westerly corner Hopestill street. Line and grade for artificial stone. Line and grade tested. Artificial stone measured.

Park street, southerly side, west of Geneva avenue. Line and grade for edgestone. Edgestone and gutter paving measured.

Robinson street, corner Robinson avenue. Edgestone paving measured in front of T. F. Lomasney estate.

Romsey street, from Dorchester avenue to Sagamore street. Line and grade for edgestone. Edgestone and gutter paving measured.

Romsey street, from Sagamore street to Sydney street. Line and grade for construction.

Rosedale street, northerly side, 295 feet from Washington street. Line and grade for edgestone. Line and grade tested. Edgestone, gutter and artificial stone measured.

Roslin street, near Washington street. Line and grade for edgestone. Edgestone and gutter paving measured.

Roslin street, northerly side, Washington street to Grace street. Line and grade for edgestone. Edgestone and gutter paving measured.

Rosseter street, ledge. Measurement of dust, screenings, cracked stone, and amount of Telford on hand, estimated.

Sagamore street, between Belford street and Romsey street. Line and grade for construction.

Sagamore street, Nos. 10 and 12. Line and grade for edgestone. Edgestone, gutter and sidewalk paving measured.

Salcombe street, between Cushing avenue and Hancock street. Line and grade for edgestone. Edgestone and gutter paving measured.

Sawyer avenue, Nos. 91 to 95. Artificial stone sidewalk measured.

Standish street, easterly side, near railroad station. Line and grade for artificial stone sidewalk. Line and grade tested. Artificial stone measured.

Sydney street, from Crescent avenue to Hartland street. Line and grade for construction.

Sydney street, northerly corner Hartland street. Line and grade for edgestone. Edgestone and gutter paving measured.

Talbot avenue, easterly side at Ashmont street. Line and grade for edgestone. Edgestone and gutter paving measured.

Talbot avenue, Washington street to New England railroad. Line and grade for edgestone.

Virginia street, No. 33. Artificial stone sidewalk measured.

Washington street, at River street. Levels taken to test grade of railroad track.

Washington street, south of Roslin street. Line and grade for construction.

Washington street, south-easterly corner Kilton street. Line and grade for edgestone. Line and grade tested. Edgestone, gutter and artificial stone measured.

Washington street, at south-easterly corner Brent street. Line and grade given for stone-wall.

Washington street, at Roslin street. Line and grade for edgestone. Edgestone and gutter paving measured.

Washington street, southerly side, near Harvard street. Measurement of artificial stone paving at Pope's estate.

Washington street, No. 332. Frontage measured for edgestone. Line and grade given for edgestone. Edgestone and gutter paving measured.

Washington street, Nos. 1171 to 1181. Edgestone paving measured.

Washington street, easterly side Welles avenue. Line and grade for edgestone. Edgestone and gutter paving measured.

Washington street, at Lower Mills. Paving measured.

Washington street, north of Armandine street. Paving measured.

Welles avenue and Washington street. Line and grade for edgestone. Line and grade tested. Edgestone and gutter paving measured.

Westville street, northerly side, between Geneva avenue and Ditson street. Line and grade for sidewalk.

Westville street, No. 64. Line and grade for artificial stone sidewalk. Line and grade tested. Edgestone, gutter and artificial stone measured.

Westville street, south-westerly corner Ditson street. Line and grade for artificial stone sidewalk. Line and grade tested. Edgestone and artificial stone measured.

Westville street, south-easterly corner Geneva avenue. Line and grade for edgestone. Line and grade tested. Edgestone, gutter and artificial stone measured.

Westville street, south-westerly corner Geneva avenue. Line and grade for edgestone. Edgestone and gutter paving measured.

Wheatland avenue, northerly side, Washington street to Whitfield street. Line and grade for edgestone. Edgestone and gutter paving measured.

WEST ROXBURY.

Adelaide street, between Boylston street and Spring Park avenue. Line and grade given for construction.

Ashland street, at Florence street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Birch street, at South street. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Boylston street, easterly side, between Washington street and Georgiana street. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Boylston street, southerly side, between Clive street and Nelson street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Boylston street, easterly corner of Egleston street. Measurement of sidewalk paving.

Centre street, at Paul Gore street. Line and grade given for sidewalk.

Centre street, near Paul Gore street. Line and grade given for sidewalk.

Centre street, easterly corner of Paul Gore street. Measurement of edgestone, gutter and sidewalk paving.

Centre street, from Sheridan street, northerly. Line and grade given for setting edgestone.

Clive street, easterly side, near Boylston street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Clive street, Line and grade given for sidewalk at No. 22. Edgestone and gutter paving measured.

Cohasset street. Line and grade given for sidewalk at No. 121.

Cohasset street, westerly side, near Corinth street. Line and grade given for sidewalk.

Corey street, between Pomfret street and Weld street. Line and grade given for gutters, and same measured.

Corey street, easterly side, south of Centre street. Line and grade given for sidewalk. Edgestone, gutter and artificial stone sidewalk measured.

Florence street, at Ashland street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Forest Hills street, line and grade given for sidewalk. Edgestone and gutter paving measured.

Forest Hills street, westerly side, near Peter Parley street. Line and grade given for sidewalk.

Hastings street, from Centre street to Montview street. Line and grade given for gutters and same measured.

Hyde Park avenue, near Walk Hill street. Grade given for filling.

Hyde Park avenue, between Woodlawn street and Tower street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Keyes street, at South street. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Keyes street, at Washington street. Line and grade given for sidewalk.

Mt. Vernon street, easterly side, just north of Montview street. Line and grade given for sidewalk. Edgestone, gutter and artificial stone sidewalk measured.

Mt. Vernon street. Line and grade given for sidewalk at No. 156.

Ophir street, at Washington street. Line and grade given for sidewalk.

Paul Gore street, at crusher. Measurement of crossing paving.

Paul Gore street. Line and grade given for sidewalk at No. 71. Edgestone, gutter and sidewalk paving measured.

Paul Gore street, at Centre street. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Peter Parley street, at Forest Hills street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Peter Parley street, south side, between Washington street and Forest Hills street. Line and grade given for sidewalk.

Peter Parley street, at Washington street. Line and revised grade given for sidewalk. Edgestone and gutter paving measured.

Peter Parley street, at Washington street. Line and grade given for sidewalk.

Ruskin street, from Corey street to Weld street. Line and grade given for construction and gutter paving measured.

School street, No. 114. Measurement of sidewalk paving.

School street, No. 175. Measurement of sidewalk paving.

South street, at Keyes street. Line and grade given for sidewalk. Edgestone, gutter and sidewalk paving measured.

Sycamore street, easterly side, from Florence street to Ashland street. Line and grade given for gutters and same measured.

Vermont street, at Mount Vernon street. Line and grade for construction.

Washington street, at Boylston street. Line and grade given for sidewalk. Edgestone and gutter paving measured.

Washington street, westerly side, between Cornwall street and Boylston street. Line and grade given for sidewalk. Edgestone, gutter and artificial stone sidewalk measured.

Washington street, at Keyes street. Line and grade given for sidewalk.

Washington street, at Ophir street. Line and grade given for sidewalk.

Washington street, at Peter Parley street. Line and revised grade given for sidewalk. Edgestone and gutter paving measured.

Washington street, at Peter Parley street. Line and grade given for sidewalk.

Brighton.

Bigelow street, between Faneuil street and Brooks street. Line and grade given for reconstruction, and gutter paving measured.

Bigelow street, between Brooks street and Dunboy street. Revised grade given.

Bigelow street, extension. Line and grade given for filling.

Cambridge street, at Linden street. Line and grade given for sidewalk. Edgestone, gutter and artificial stone sidewalk measured.

Elmira street, between Murdock street and George street. Line and grade given for construction.

Leicester street, between Washington street and Bennett street. Line and grade given for construction.

Linden street, at Cambridge street. Line and grade given for sidewalk. Edgestone, gutter and artificial stone sidewalk measured.

Linden street, at Commonwealth avenue. Line and grade given for construction.

Newton street, extension. Line and grade given for filling.

Oakland street, at Washington street. Line given for building wall.

Reedsdale street, at Commonwealth avenue. Line and grade given for construction.

Washington street, between Cambridge street and Commonwealth avenue. Line and grade given for reconstruction. Edgestone and gutters measured.

Western avenue, southerly side, between Spurr street and the bridge. Grade given for sidewalk.

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JAN. 31, 1897.

Indexed.	General Head under which Classified.	Number of Plans.
Vol. A.....	Plans of estates (lithographed).....	221
" B.....	" " " "	187
" C.....	" " " " in Brighton.....	31
" D.....	" " " " in West Roxbury.....	56
" E.....	" " " "	17
" F.....	" " " "	2
" 1 to 13[1].....	" " " widenings, etc.....	664
" {14, 15, 16, and 17}	" " "	505
" 18.....	School-house and miscellaneous plans.....	95
" 19.....	Plans from actual survey in City Proper.	130
" 20.....	Profiles of City Proper and Boston Harbor, and ancient plans.....	91
" 21.....	Plans and profiles of streets in East Boston, 1849.....	45
" 22.....	" " " " " " " " " 1868.....	45
" 23.....	" " " " " " South Boston, 1848.....	27
" 24.....	" " " " " " " " " 1860.....	39
" 25.....	" " " " " at South End.....	21
" 26.....	" " " " " in Church and Suffolk street Dists	38
" 27.....	" " " " various streets	16
" 28.....	" " " " streets at South End.....	15
" 29.....	Miscellaneous plans, estates, etc.....	69
" 30.....	" " " " "	97
" 31.....	Official plans from 1851 to 1854.....	103
" 32.....	Plans of estates.....	112
" 33.....	" " "	131
" 34.....	" " "	108
" 35.....	" " "	256
" 36.....	" " "	118
" {38 39}	Hale's plans of the streets in Boston, 1819.....	176
" 40.....	Plans of estates.....	66
" 41.....	" " "	494
" 42.....	Ancient plans of estates in South Boston, etc.....	46
" 43.....	Sectional plans of city lands at South End.....	24
" 44.....	Plans of estates in Roxbury.....	77
	Carried forward.....	4,122

[1]Vol. 8 is a set of Architects' plans, and has been transferred to the Public Buildings Department.

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JAN. 31, 1897.—*Continued.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	4,122
Vol. 45	Plans of estates in Roxbury	70
" 46	" " " " "	80
" 47	" " widenings in Roxbury	50
" 48	" " " etc., in Roxbury	140
" 49	" " " " " "	73
" 50	Third Parish and Grammar School lands in Roxbury	57
" 51	Plans of widenings in Roxbury	59
" 52	" " city lands and widenings in Roxbury	92
" 53	Profiles of streets in Roxbury	76
" 54	" " " " "	87
" 55	" " " " "	42
" 56	" " " " "	56
" 57	Plans of widenings in Brighton	25
" 58	" " estates in Brighton	115
" 59	" " " " "	74
" 60	" " city property, etc., in Brighton	18
" 61	" " widenings in West Roxbury	75
" 62	" " " " " "	44
" 63	Profiles of streets	58
" 64	Plans of city property, etc., in West Roxbury	27
" 65	" " estates, etc., in West Roxbury	199
" 66	" " " " " " "	217
" 67	" " " " " " "	73
" 68	" " " " " " " and Brighton	152
" 69	" " " "	140
" 70	" " " "	183
" 71 to 82	Charlestown plans, in bound volumes, showing street-widenings and estates	626
" 83	Charlestown street surveys	229
" 84	Miscellaneous plans	106
" 85	Plans of estates in Roxbury	485
" 86	" " " " "	18
" 87	" " " etc	169
" 88	" " " "	32
	Carried forward	8,069

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JAN. 31, 1897.—*Continued.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	8,069
Vol. 89	Plans of estates, etc	140
" 90	" " " "	10
" 91	Insurance volumes	25
" 92	" "	31
" 93	" "	28
" 94	" "	27
" 95	Dorchester surveys	65
" 96	" "	61
" 97	" "	63
" 98	Plans of estates, etc	99
" 99	" " " in Dorchester	434
In Drawer A	Maps of Boston, etc	69
" Cases CC	Miscellaneous rolled plans	682
" Drawer E	Plans from surveys in City Proper	560
" " F	Plans and profiles from surveys in City Proper and Roxbury	670
" " G	South Boston plans and profiles	330
" " H	East Boston plans and profiles	129
" " L	Official plans, profiles, etc	2,819
" " M	Copies of plans by other surveyors	322
" " N	Plans of city lands	201
" Case T	Miscellaneous rolled tracings	338
	4 vols. tracings of plans and profiles	632
In Drawers	" " " "	257
Vol. I. to LXIV	Copies of official plans indexed in Vol. 31 and Drawer L,	2,632
	Maps, etc., in bound volumes	1,450
	Miscellaneous plans of the Back Bay Commission in portfolio	15
	Hanging plans	23
	Plans in progress, City Proper	62
	" " " South Boston	63
	" " " East Boston	43
	" " " Roxbury	92
	" " " Dorchester	142
	" " " West Roxbury	90
	Carried forward	20,673

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JAN. 31, 1897.—*Concluded.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	20,673
	Plans in progress, Brighton	91
	" " " Charlestown	12
	South Boston sectional plans	42
	East Boston " "	54
	Roxbury " "	163
	West Roxbury " "	83
	Sectional plans filed by Board of Survey	302
	Plans filed by the Boston Transit Commission	11
	15 vols. copies of Assessors' plans	1,579
	Indexed plans of Dorchester	2,312
	Sectional plans "	232
	Miscellaneous plots and plans of Dorchester	527
	Blue prints of official and progress plans	149
	Plans of proposed streets submitted by owners and approved by the Board of Street Commissioners:	
	East Boston	12
	Roxbury	38
	Dorchester	129
	Charlestown	1
	West Roxbury	69
	Brighton	37
	Plans of proposed streets submitted by owners for the approval of the Board of Street Commissioners now under consideration:	
	Roxbury	22
	Dorchester	76
	West Roxbury	45
	Brighton	33
		26,692

There are also 4,798 lithographed plans in the office at Old Court House not included in the foregoing list, viz.:

Lithographed maps of Dorchester, made in 1869	39
" " " " " 1880	155
" " " West Roxbury, made in 1873	38
" " " Brighton, made in 1873	17

Lithographed maps	of	Fort Hill, made in 1866–69	103
"	"	" Church-st. district, made in 1868	189
"	"	" Washington-st. widening (parts 1, 2, 3), made in 1860	1,197
"	"	" Washington-st. extension, made in 1869	330
"	"	" North street, made in 1859	44
"	"	" Stony brook, drainage area	10
"	"	" Boston, made in 1866–67	109
"	"	" Boston, made in 1888	125
"	"	" Suffolk-st. district, made in 1869	33
"	"	" South Boston, made in 1880	74
"	"	" Roxbury, made in 1880	114
"	"	" Charlestown, made in 1890	4
"	"	" Burnt district	77
"	"	" Mt. Hope Cemetery	28
"	"	" Winthrop Farm	49
"	"	" Hanover avenue	44
"	"	" Muddy river	44
"	"	" Pemberton square, Court House site	216
"	"	" East Newton street, lots on, sold by auction, made in 1888	42
"	"	" Public lands in South Boston, sold by auction, made in 1885	82
"	"	" Public lands in South Boston, sold by auction, made in 1888	8
"	"	" Boylston street, old Public Library lot	17
"	"	" Public lands in South Boston, sold by auction, made in 1882	136
"	"	" Boston, Directory map, made in 1886	60
"	"	" Boston, scale 1,600 feet to an inch, made in 1890	300
"	"	" Boston, scale 800 feet to an inch, made in 1891, colored plans	13
"	"	" Boston proper, scale 500 feet to an inch, made in 1894	16
"	"	" Exhibit No. 1, City Surveyor's Report, 1893	133
"	"	" Exhibit No. 2, City Surveyor's Report, 1893	115
"	"	" Exhibit No. 3, City Surveyor's Report, 1893	114
"	"	" High street, public lands sold by auction,	16
"	"	" Beacon Hill, State House site	41
"	"	" Harrison avenue, Savage School-house lot, auction plan	57
"	"	" Boston proper, showing changes in street and wharf lines from 1795 to 1895	609
			4,798

B.

[FROM THE CITY ENGINEER'S REPORT TO THE WATER COMMISSIONER.]

SOURCES OF SUPPLY.

The rainfall during the year 1896 was about 10 per cent below the average for the past thirty-four years and the conditions so serious as to arouse fears of a scarcity of water, which fortunately were not realized.

The rainfall and quantities collected on the several watersheds were as follows: —

	Sudbury.	Cochituate.	Mystic.
Rainfall, in inches	43.705	42.780	39.795
Rainfall collected, in inches	21.453	20.834	19.044
Daily average yield of watershed, in gallons	76,628,967	18,667,700	24,302,000

Reservoir No. 1.

Grades, H.W., 161.00; Tops of Flash-boards, 159.29 and 158.41; Crest of Dam, 157.54; Area, Water Surface, 143 acres; Greatest Depth, 14 ft.; Contents below 161.00, 376,900,000 gals.; Below 159.29, 288,400,000 gals.

The surface of this reservoir was at grade 158.11 on Jan. 1, 1896; at this time water was wasting over the dam, and so continued until April 13, when the flash-boards were placed in position.

On April 16 waste began over the flash-boards and continued until May 1. On August 7 the flash-boards were removed from the dam. On Novemer 7 the water surface reached grade 157.67 and waste began and continued until December 3.

The water surface again reached the crest of the dam on Jan. 8, 1897; waste began and continued until the 12th. On Feb. 1, 1897, the water surface was at grade 156.13. The dam is in good condition.

Reservoir No. 2.

Grades, H.W., 168.00; Tops of Flash-boards, 167.12 and 166.49; Crest of Dam, 165.87; Area, Water Surface, 134 acres; Greatest Depth, 17 ft.; Contents below 168.00, 568,300,000 gals.; Below 167.12, 529,860,000 gals.

On Jan 1, 1896, water was wasting over dam the water surface being at grade 166.17. Waste continued until April

13, when the flash-boards were placed upon the dam. On April 16 waste began over flash-boards and continued until May 28, excepting April 19, 20 and 29. On August 7 the flash-boards were removed. On March 31 the reservoir was drawn upon for the supply of the city. Water was run into reservoir, from reservoirs Nos. 4 and 6, during a few days in March; from reservoir No. 4 during July; from reservoirs Nos. 4 and 6 during August and September; and from reservoir No. 6 during October and twenty days of November. On Feb. 1, 1897, the water surface was at grade 161.37. The dam is in good condition.

Reservoir No. 3.

Grades, H.W., 177.00; Crest of Dam (no Flash-boards), 175.24; Area at 177.00, 253 acres; Contents below 177.00, 1,224,500,000 gallons. Area at 175.24, 248 acres; Contents below 175.24, 1,081,500,000 gallons. Greatest Depth, 21 ft.

On Jan. 1, 1896, water was wasting over crest of dam, and this waste continued until May 12, with the exception of March 17 to March 22. From May 13 the water surface fell slowly, and on August 6 it was 7.01 feet below the crest of the dam. Filling gradually, from August 6, the water surface reached the crest of the dam on November 5, and from that date until December 27 water wasted over the dam. On Feb. 1, 1897, the water service was at grade 173.31. The dam is in good condition.

Reservoir No. 4.

Grades, H.W., 215.21; Tops of Flash-boards, 215.21+ and 214.89; Crest of Dam, 214.23; Area, Water Surface, 167 acres; Greatest Depth, 49 ft.; Contents below 215.21, 1,416,400,000 gallons.

On Jan. 1, 1896, the water service in this reservoir was .37 feet below the crest of the dam. On January 3 waste began and continued until April 13, excepting March 19, 20 and 21.

On April 13 one set of flash-boards was placed upon the dam, and waste occurred over this set on April 16 and 17.

On April 18 the second set of flash-boards were placed in position, and waste continued until June 27. On June 26 the reservoir was drawn upon for the supply of the city, and on September 29 the water surface had fallen 32.11 feet below the crest of the dam.

Since September 29 it has been gradually filling, and on Feb. 1, 1897, the water surface was at grade 199.89.

The dam is in good condition.

Reservoir No. 6,

Grades, H.W., 295.00; Top of Flash-boards, 295.00; Crest of Dam, 294.00. Estimated Area, 185 acres; Estimated Contents, 1,530,300,000 gals.

On Jan. 1, 1896, the water surface in this reservoir was at grade 294.39 and water was wasting over the dam, and so continued until April 13, with the exception of March 19, 20, 21 and 22.

On April 13 one set of flash-boards was placed on the dam, and on April 17 the second set was placed in position.

On April 20 the second set was removed and waste occurred from April 20 to April 28, on which date the second set was again placed upon the dam. Water wasted over the dam from May 3 to May 14, also from May 29 to June 20. On August 14 the flash-boards were removed. On August 1 the water surface began to fall, and reached its lowest point on November 20, being 32.31 feet below the crest of the dam on that date, since then it has been gradually filling, and on Feb. 1, 1897, the water surface was at grade 271.59. The dam is in good condition.

Whitehall Pond.

Elevation, H.W., 327.91; Bottom of Gates, 317.78. Area at 327.91, 601 acres; contents, between 327.91 and 317.78, 1,256,900,000 gals.

On Jan. 1, 1896, the water surface was at grade 325.29, or 2.62 feet below high water. It reached grade 326.52 on April 20, and remained at about this height until July 1, when the water surface began to fall slowly, being at grade 324.70 on November 2. Since that date it has remained at about this grade, being, on Feb. 1, 1897, at grade 325.45. Water was drawn from the lake for the supply of the city from January 1 to March 29, from September 16 to October 14, and from November 17 to 30.

It was decided to build a temporary dam, in order to raise the water in this basin two feet; this work is now in progress. The storage capacity will be increased about 400,000,000 gallons.

Farm Pond.

Grades, H.W., 149.25; Low Water, 146.00. Area at 149.25, 159 acres; Contents, between 149.25 and 146.00, 165,500,000 gals.

No water has been drawn from this pond for the supply of the city during the year 1896. On Jan. 1, 1896, the surface of the pond was at grade 149.67 or .42 feet above high water mark, the water surface rose slowly during January, and on February 12 was at grade 150.22. During March and April

it remained at about grade 149.50. It began to fall in May and reached the lowest point of the year on September 5, being at grade 148.21 on that date. During the remainder of the year it has remained at about grade 148.80, being at grade 149.00 on Feb. 1, 1897.

The Framingham Water Co. has drawn 139,300,000 gallons from the pond during the year.

Lake Cochituate.

Grades, H.W., 134.36; Invert Aqueduct, 121.03; Top of Aqueduct, 127.36. Area, Water Surface at 134.36, 785 acres; Contents, between 134.36 and 127.36, 1,515,180,000 gals ; between 134.36 and 125.03, 1,910,280,000 gals.; Approximate Contents, between 134.36 and 121.03, 2,447,000,000 gals.; Between 134.36 and 117.03, 2,907,000,000 gals.

The dam is in good condition. On Jan. 1, 1896, the surface of the lake was 2.06 feet below high water mark; filling gradually, high water mark was reached on April 24. The water surface fell during the remainder of the year, being at grade 128.75 or 5.61 feet below high water mark on Feb. 1, 1897.

The beds for filtering the water of Pegan brook have been in use for the greater portion of the year, and 258,099,000 gallons have been pumped upon them. No difficulty has been experienced in their operation during the winter season. Water has been drawn from the different reservoirs as follows: —

From	7	A.M.	Jan.	1	to	12	M.	Jan.	6	from Reservoir	No. 2.
"	12	M.	Jan.	6	"	11	A.M.	Mar.	31	" "	No. 1.
"	11	A.M.	Mar.	31	"	5	P.M.	Apr.	15	" "	Nos. 1, 2.
"	5	P.M.	Apr.	15	"	9	A.M.	Apr.	17	No flow.	
"	9	A.M.	Apr.	17	"	2	P.M.	May	13	from Reservoir	Nos. 1, 2.
"	2	P.M.	May	13	"	12.30	P.M.	May	15	No flow.	
"	12.30	P.M.	May	15	"	11	A.M.	Nov.	5	from Reservoir	Nos. 1, 2.
"	11	A.M.	Nov.	5	"	7	A.M.	Nov.	18	" "	No. 2.
"	7	A.M	Nov.	18	"	1.30	P.M.	Dec.	17	" "	Nos. 1, 2.
"	1.30	P.M.	Dec.	17	"	2.45	P.M.	Dec.	17	" "	No. 1.
"	2.45	P.M.	Dec.	17	"	7	A.M.	Feb.	1, 1897	"	Nos. 1, 2.

The height of the water in the various storage reservoirs on the first day of each month is as follows: —

	Reservoirs.					Farm Pond.	Whitehall Pond.	Lake Cochituate.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 6.			
	Top of Flash-boards.	Top of Flash-boards.	Crest of Dam.	Crest of Dam.	Top of Flash-boards.	High Water.	High Water.	Top of Flash-boards.
	159.29	167.12	175.24	214.23	295.00	149.25	327.91	134.36
Jan. 1, 1896..	158.11	166,17	175.75	213.86	294.39	149.67	325.29	132.30
Feb. 1, 1896..	157.80	166.16	175.48	214.51	294.27	149.80	325.09	132.40
Mar. 1, 1896..	159.50	167.33	176.53	215.38	295.27	149.54	325.77	133.66
April 1, 1896..	158.24	166.37	175.80	214.78	294.56	149.54	325.86	133.92
May 1, 1896..	159.30	167.35	175.44	215.20	294.96	149.44	326.58	134.25
June 1, 1896..	156.91	166.65	172.58	215.24	295.13	149.18	326.59	133.27
July 1, 1896..	156.91	162.40	173.02	213.70	294.76	148.95	326.47	132.22
Aug. 1, 1896..	157.05	162.73	168.55	198.52	294.64	148.59	326.09	130.55
Sept. 1, 1896..	157.00	162.73	168.33	185.22	282.24	148.25	325.62	128.92
Oct. 1, 1896..	157.00	162.82	171.36	182.25	270.93	148.59	325.19	128.25
Nov. 1, 1896..	156.90	163.54	174.75	186.79	268.45	148.72	324.69	127.90
Dec. 1, 1896..	157.71	163.70	175.50	190.78	264.18	148.83	324.36	127.80
Jan. 1, 1897..	156.37	162.63	174.82	195.11	266.41	148.78	324.77	127.43
Feb. 1, 1897..	156.13	161.37	173.31	199.80	271.59	149.00	325.45	128.75

Aqueducts and Distributing Reservoirs.

The Sudbury-river aqueduct has been in use 359.6 days, and has delivered 14,857,300,000 gallons to Chestnut-Hill reservoir and 35,500,000 gallons to Lake Cochituate. The Cochituate aqueduct has been used 362.4 days and delivered 5,731,790,000 gallons.

Both aqueducts have been cleaned during the year. The different distributing reservoirs are in good condition.

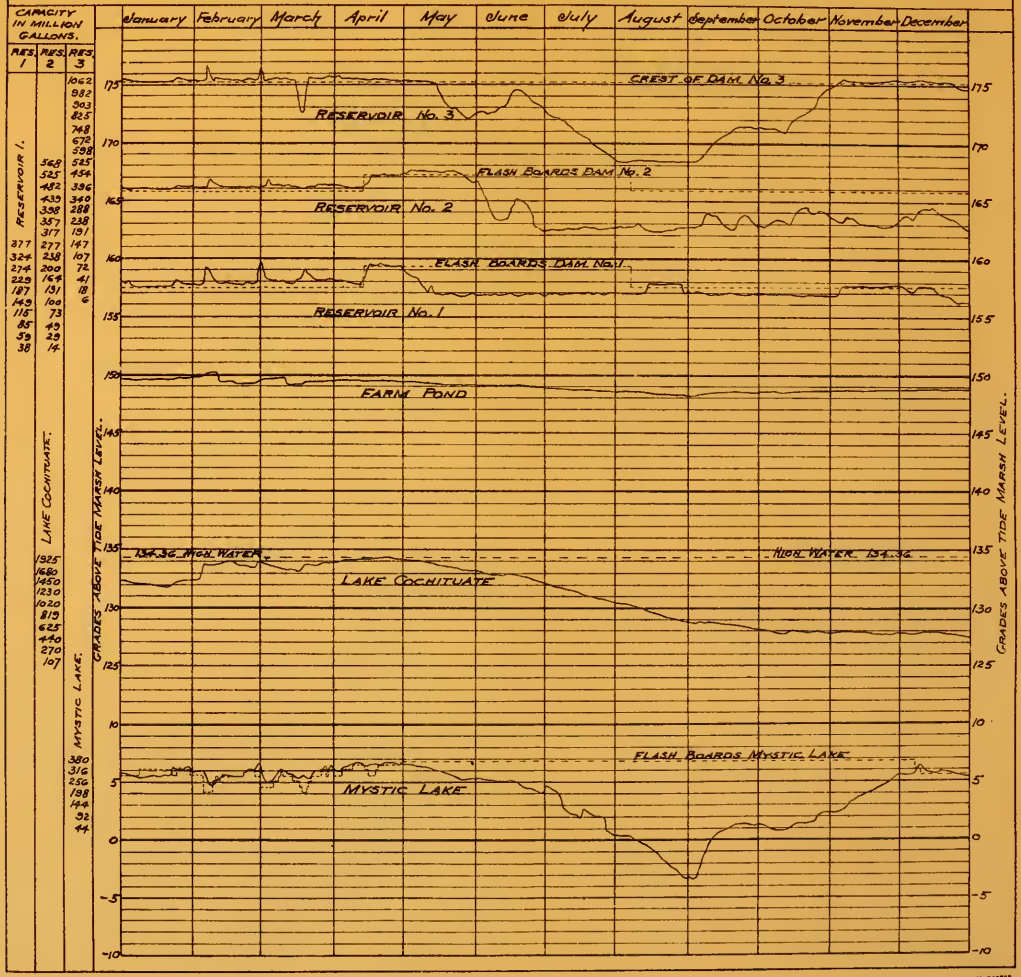
High-Service Pumping Stations.

The daily average quantity pumped at the Chestnut-Hill pumping station was 28 per cent. more than in 1895.

Engine No. 1 was run 804 hours, 45 minutes, pumping . . .	301,560,800 gallons.
Engine No. 2 was run 758 hours, 35 minutes, pumping . . .	286,377,150 gallons.
Engine No. 3 was run 6,395 hours, 1 minute, pumping	4,594,872,800 gallons.
Total amount pumped . .	5,182,810,750 gallons.

Boston Water Works.

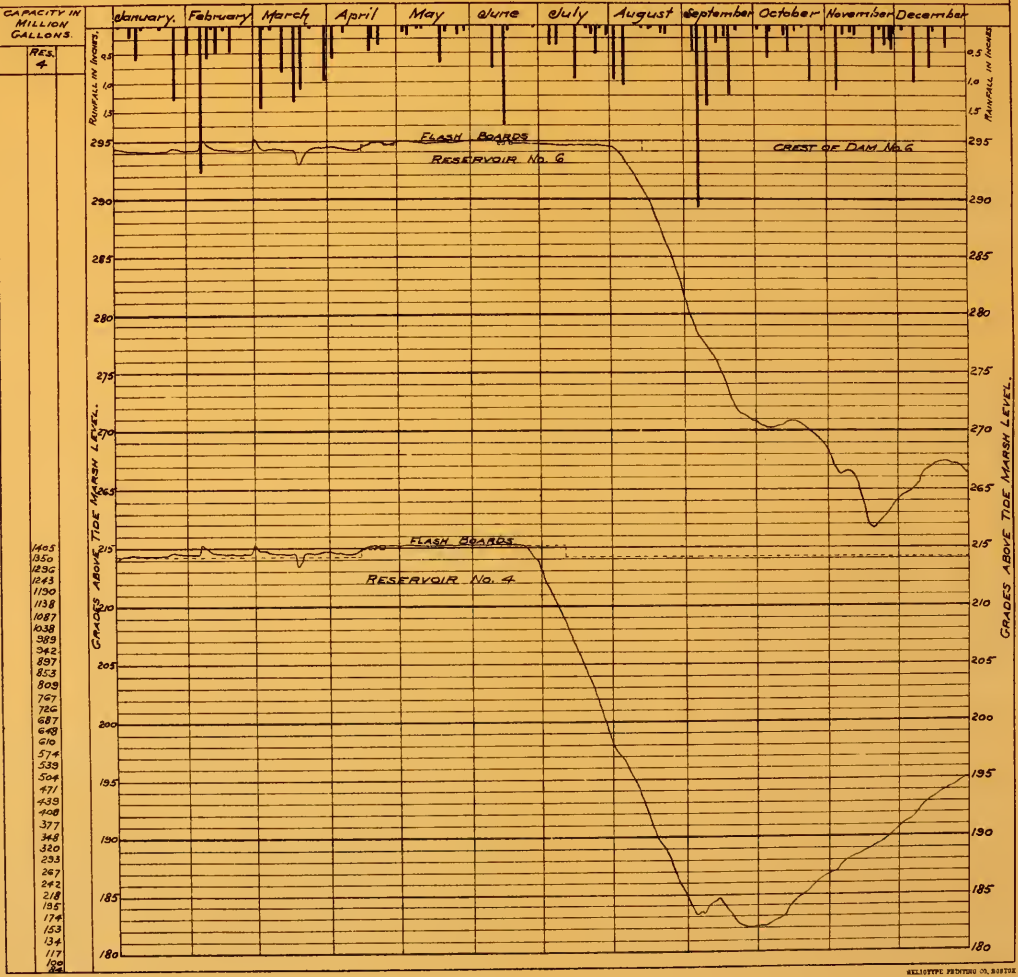
Diagram showing the heights of Sudbury River Reservoirs Nos. 1, 2 and 3. Farm Pond and Cochituate and Mystic Lakes during the Year 1896.



MILLIOTYPE PRINTING CO. BOSTON

Boston Water Works.

Diagram showing the heights of Sudbury River Reservoirs Nos. 4 and 6. and the Rainfall on the Sudbury River Water Shed during the year 1896.



Heliotype Printing Co. Boston

Amount of coal used by Engines Nos. 1 and 2	715,387 lbs.
Amount of coal used by Engine No. 3	4,427,668 lbs.
Total amount of coal used	5,143,055 lbs.
Percentage of ashes and clinkers	10.8
Quantity pumped per lb. of coal by Engines Nos. 1 and 2	821.8 gallons.
Quantity pumped per lb. of coal by Engine No. 3	1,037.8 gallons.
Average lift in feet, Engines Nos. 1 and 2	121.07
Average lift in feet, Engine No. 3	123.16
Daily average amount pumped	14,609,100 gallons.

Table VII., on pages 94 and 95, show in detail the work done by the engines and boilers.

COST OF PUMPING.

Salaries	$15,915 24
Fuel	10,441 73
Repairs	1,438 51
Oil, waste and packing	1,413 06
Small supplies	542 13
Total	$29,750 67
Cost per million gallons raised one foot high	$0.0495
Cost per million gallons pumped to reservoir	$5.74

At the West Roxbury pumping-station the daily average quantity pumped was 253,200 gallons, an increase of 41.3 per cent over the amount pumped in the previous year. At the East Boston pumping-station 483,000 gallons per day have been pumped for the supply of the high-service district, and 57,600 gallons per day for the Breed's Island high-service. Owing to the non-completion of the 36-inch high-service line through Roxbury, it was necessary to maintain the pumping plant on Blue Hill Avenue and Wayne Street during the year, and to keep it in constant service.

MYSTIC LAKE.

On Jan. 1, 1896, the water surface was .96 feet below high water; waste was then occurring over the dam and continued until May 2, excepting the period between January 9 and 24.

The water surface, which on May 2 was at grade 6.75, gradually fell, reaching its lowest point on September 5; the water surface being at grade — 3.26, or 10.26 feet below high water.

Filling gradually from September 5, it reached grade 6.40 on December 12. Waste occurred over stop-planks on dam from December 10 to 25; from Jan. 6 to 11, 1897, and from Jan. 22 to 24, 1897. On Feb. 1, 1897, the water surface was at grade 5.85. The fishway was opened on April 15, and was kept open until June 12, when it was closed, and remained so during the rest of the year. The dam at the outlet of the lake is in good condition.

MYSTIC CONDUIT AND RESERVOIR.

The conduit has been cleaned several times during the year.

MYSTIC PUMPING STATION.

The daily average quantity pumped at the Mystic station was 26.2 per cent more than in 1895.

Engine No. 1 was run 1,962 hours, 15 minutes, pumping . . .	421,731,900 gallons.
Engine No. 2 was run 1,030 hours, 45 minutes, pumping . . .	208,004,600 gallons.
Engine No. 3 was run 6,540 hours, 45 minutes, pumping . . .	2,222,277,100 gallons.
Engine No. 4 was run 3,430 hours, 30 minutes, pumping . . .	1,522,599,300 gallons.
Total amount pumped . .	4,374,612,900 gallons.
Amount of coal used by Engines Nos. 1, 2 and 3	6,907,870 lbs.
Amount of coal used by Engine No. 4	1,792,100 lbs.
Total amount of coal used .	8,699,970 lbs.

Percentage of ashes and clinkers	11.6
Quantity pumped per lb. of coal by Engines Nos. 1, 2 and 3	412.9 gallons.
Quantity pumped per lb. of coal by Engine No. 4	849.6 gallons.
Average lift in feet, Engines Nos. 1, 2 and 3	145.72 gallons.
Average lift in feet, Engine No. 4	152.70 gallons.
Daily average amount pumped	11,952,500 gallons.

COST OF PUMPING.

Salaries	$13,749 51
Fuel	15,706 84
Repairs	2,914 61
Oil, waste and packing	1,725 62
Small repairs	348 79
Total	$34,445 37

Cost per million gallons raised one foot high	$0.053
Cost per million gallons pumped to reservoir	$7.88

Table VIII., on pages 96 and 97, shows in detail the work done by the engines during the year.

CONSUMPTION.

The daily average consumption for the year was as follows: —

Sudbury and Cochituate Works	56,288,200 gallons.
Mystic works	11,951,100 "
Total for the combined supplies,	68,239, 300 "

an increase of 3,426,000 gallons, or 13.2 per cent over that of the previous year. During the year Charlestown has been supplied from the Mystic Works, excepting the periods between January 1 to 7 and July 13 to September 28, when

the supply was from the Cochituate Works. The following table shows the consumption per inhabitant for the past two years: —

MONTH.	COCHITUATE.		MYSTIC.		COMBINED SUPPLIES.	
	Consumption in Gallons per Capita.		Consumption in Gallons per Capita.		Consumption in Gallons per Capita.	
	1895.	1896.	1895.	1896.	1895.	1896.
January	104.9	128.1	92.0	96.2	102.7	121.0
February	128.4	134.8	94.8	102.5	120.7	127.4
March	107.1	134.5	83.5	96.9	102.9	125.9
April	94.5	118.3	77.3	87.3	91.5	111.2
May	97.3	106.9	77.6	85.8	93.3	102.1
June	102.0	113.2	83.2	88.4	97.6	110.1
July	104.2	116.0	76.8	85.9	98.7	107.2
August	107.0	112.9	76.5	85.4	101.6	107.9
September	107.1	107.1	93.3	83.1	104.7	102.7
October	98.9	106.4	81.1	78.8	95.8	100.1
November	96.7	107.3	78.8	76.5	93.6	100.2
December	105.9	118.6	86.1	90.6	102.4	112.1
Average	104.3	116.8	83.3	88.3	100.3	110.6

DISTRIBUTION.

On the Cochituate Works 33.8 miles of pipe were laid and 9.8 miles abandoned, making a net increase of 24 miles and a total of 620 miles now connected with the system. Early in the spring a 16-inch high service main was laid from Upham's Corner to Thomas Park by way of Boston, Dorchester and Telegraph streets, affording an additional supply for the South Boston high service district and making the reservoir on Thomas Park, which the city contemplated taking for a high school site, no longer necessary. The length of pipe laid was 8,491 feet, of which amount 3,667 feet was laid by contract; this line is not yet in service and will be used only in an emergency until the completion of the 36-inch, 30-inch and 20-inch mains through Roxbury and Dorchester.

The 24-inch low service main in Dorchester was extended from Dorchester avenue and East street, through Dorchester avenue and Adams street, a distance of 3,888 feet, all the

work being done by contract. This extension has increased the minimum head at the Lower Mills 7 feet, as shown in Table VI. A further extension of this line to Milton Lower Mills should be made during the coming season.

In June the 42-inch high service main was completed and placed in service; as shown on Table No. VI. the minimum head in the city proper was increased nearly 20 feet. During the months of October and November it was decided to put the 48-inch high service main in Brookline out of service during the construction of a sewer by the town of Brookline in Walnut street, in close proximity to the water pipe, the excavation for the sewer being largely in solid rock; the reduction in pressure and the consequent small consumption in gallons on the high service can be seen in Tables VI. and VII., on pages 93, 94 and 95. In September, for the better protection of East Boston, in case of fire, and also to give an adequate supply for domestic use, a 20-inch low service main was laid from the corner of Brooks and Condor streets to Central square by way of Condor and Border streets, the length laid being 3,773 feet, of which amount 2,131 feet was laid by contract. This line has increased the minimum head 12 feet. During the coming season it is intended to extend the 20-inch pipe in Border street to Maverick street and to lay a 16-inch line to Maverick square.

In May of this year an 8-inch pipe, with Ward's flexible joints, was laid across Shirley gut to replace the two lines of similar pipe laid in 1870; the latter had been broken a number of times, and were entirely exposed to a blow from passing vessels on the Deer Island shore; as a matter of fact both were broken in this way before water was turned on the new line. The work was done, under contract, by George W. Townsend; the pipe was first jointed on the Winthrop shore, upon rollers, and was then hauled across the gut, empty oil barrels being lashed to it to facilitate the work; it is laid in a trench, excavated six feet deep on each shore to low water mark; at that point the trench decreases in depth until it is one foot deep at the middle of the channel.

No trouble was experienced during the past winter with the service between the islands in the harbor; while the cold was severe at times, it was not long continued. The precaution was taken of tapping the pipes on each island at high water mark; during a cold snap the temperature of the water in the pipes was taken daily at the different points established. In this way the exact conditions are known, and danger of freezing can probably be averted.

Sectional plans of the city proper on a scale of 50 feet to the inch are being prepared; they are based entirely upon actual surveys.

The distributing mains connected with the Mystic Works have been extended 5.4 miles and 0.05 mile have been relaid. The total length now in service is 184 miles. There has been an increase of 253 in the number of hydrants connected with the Cochituate Works, making a total now in use of 6,711. On the Mystic Works 96 hydrants have been added, and the total now in use is 1,639; 243 petitions for main pipe have been reported upon, and 64 contracts for rock excavation have been made. Various profiles have been made, levels taken and lines and grades furnished for the main pipe laying. All pipe laid has been located and plotted on the plans.

Appended to this report will be found the usual tables of rainfall, consumption, etc., for the past year, and, in addition, tables are given of the rainfall, rainfall collected, and percentage collected on the Cochituate water-shed since 1863, on the Sudbury river water-shed since 1875, and on the Mystic water-shed since 1878. These will be found valuable for future reference.

GENERAL STATISTICS.

SUDBURY AND COCHITUATE WORKS.	1893.	1894.	1895.	1896.
Daily average consumption in gallons,	47,453,200	46,560,000	50,801,100	56,288,200
Daily average consumption in gallons per inhabitant	107.5	99.8	104.3	116.85
Daily average amount used through meters, gallons	11,651,600	11,170,400	12,084,500	13,125,700
Percentage of total consumption metered	24.5	24.0	23.8	23.3
Number of services	66,586	68,556	70,879	73,230
Number of meters and motors	4,585	4,877	4,910	4,788
Length of supply and distributing mains, in miles	560	572.8	595.9	619.9
Number of fire-hydrants in use	6,042	6,217	6,458	6,711
Yearly revenue from water-rates	$1,638,772 21	$1,657,701 23	$1,743,292 35	$2,038,526 07
Yearly revenue from metered water	$683,948 52	$672,474 17	$711,467 39	$775,354 91
Percentage of total revenue from metered water	41.8	40.5	40.8	38.0
Cost of works on February 1	$22,727,456 03	$23,583,967 89	$25,052,227 53	[2] $24,608,500 60
Yearly expense of maintenance [3]	$433,408 18	$440,840 63	$420,907 09	$617,566 53
MYSTIC WORKS.				
Daily average consumption in gallons,	10,742,500	10,282,100	9,467,000	11,951,100
Daily average consumption in gallons per inhabitant	84.4	87.6	83.3	88.26
Daily average amount used through meters, gallons	1,921,570	2,014,000	2,105,800	2,144,300
Percentage of total consumption metered	17.9	19.6	22.2	17.9
Number of services	22,398	23,257	24,120	24,870
Number of meters and motors	482	515	525	536
Length of supply and distributing mains, in miles	165	173.7	178.6	184.0
Number of fire-hydrants in use	1,306	1,446	1,543	1,639
Yearly revenue from water-rates	$422,707 31	$453,627 50	$471,188 47	$501,755 05
Yearly revenue from metered water	$109,367 37	$115,811 32	$121,436 10	$122,050 66
Percentage of total revenue from metered water	25.9	25.6	25.8	24.3
Cost of works on February 1	$1,721,609 33	[1] $1,676,471 94	$1,803,775 29	$1,806,316 72
Yearly expense of maintenance	$160,643 97	$156,214 05	$189,194 61	

[1] $52,637.00 credited on account of sale of portion of Mystic sewer.
[2] $1,118,975.74 credited by amount paid by State.
[3] Mystic department combined with Cochituate.

TABLE I.

Daily Average Consumption of Water, in Gallons, from the Cochituate and Mystic Works.

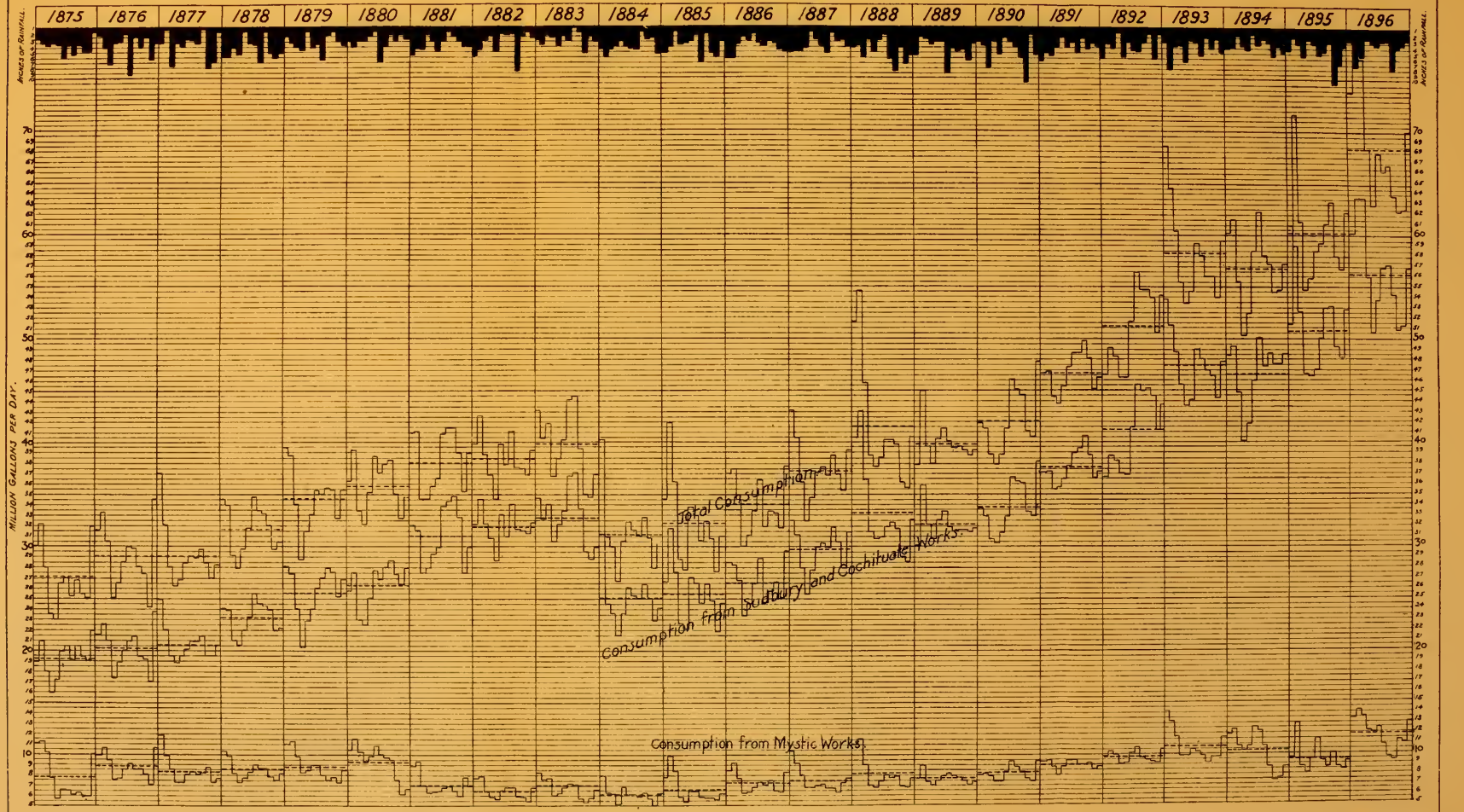
	Cochituate Works.							Mystic Works.						
Month.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
January	33,680,000	37,230,100	36,756,400	53,847,100	48,395,000	51,476,100	60,284,800	8,187,900	9,389,300	9,878,200	14,129,700	11,823,500	[3]9,528,100	13,462,300
February	33,030,700	37,280,700	38,881,500	51,299,400	49,207,500	58,905,100	63,526,700	8,299,700	9,466,900	10,332,200	13,174,700	12,295,000	12,953,200	14,290,700
March	30,844,400	35,533,400	38,395,100	48,700,200	44,844,300	52,706,700	63,513,300	8,055,800	8,811,000	9,970,500	11,692,700	10,720,800	8,712,200	13,552,300
April	30,446,600	35,751,600	37,171,000	45,573,100	40,070,200	46,614,200	56,002,300	7,481,600	8,045,800	9,145,000	9,812,500	10,236,200	8,098,000	12,262,100
May	31,381,200	36,580,700	37,055,900	43,451,500	41,827,700	46,470,500	50,684,500	7,488,400	8,841,300	9,204,900	9,817,400	10,661,000	9,426,500	12,087,100
June	33,022,700	37,801,900	41,564,000	44,125,100	45,906,400	47,089,500	53,757,900	8,396,000	9,478,400	10,146,300	[1]10,460,000	12,552,300	11,509,200	12,497,800
July	36,701,100	39,062,600	45,738,100	48,986,900	50,044,000	50,064,800	56,937,700	9,463,300	9,581,700	10,702,900	[1]10,167,000	12,172,000	9,265,900	[4]10,908,600
August	36,316,000	39,460,400	45,031,600	48,062,000	47,288,500	53,095,100	57,215,700	8,932,200	9,122,300	9,751,500	9,826,200	10,696,700	8,117,400	9,620,200
September	36,165,800	40,677,700	45,261,900	46,926,500	[2]48,558,700	53,246,900	54,345,200	8,436,700	9,128,700	9,549,400	9,115,000	[2]8,703,600	9,937,900	9,403,300
October	32,429,800	53,884,600	44,626,790	46,416,600	47,072,500	49,278,000	[5]50,947,600	7,784,100	9,259,100	9,340,500	9,630,400	7,421,200	8,667,300	11,302,700
November	33,955,100	36,640,800	41,347,800	44,328,900	47,101,500	48,258,600	[5]51,441,700	7,601,300	8,585,200	9,230,000	9,569,700	7,563,100	8,453,400	11,003,700
December	38,334,100	37,342,500	43,766,400	47,807,800	48,511,600	52,934,800	56,957,700	9,448,300	8,960,600	10,473,700	11,620,800	8,667,800	9,276,700	13,088,400
Yearly average.	33,871,700	37,686,900	41,312,400	47,453,200	46,560,000	50,801,100	56,288,200	8,301,400	9,055,290	9,810,800	10,742,500	10,282,100	9,457,000	11,951,100

[1] From June 7 to July 29 about 3,000,000 gallons per day were wasted from a blow-off.
[2] After September 12 Charlestown was supplied with Cochituate water.
[3] Charlestown was supplied with Cochituate water from January 1 to February 6, February 21 to May 18, and July 13 to Jan. 1, 1896.
[4] Charlestown was supplied with Cochituate water from January 1 to 7, July 13 to September 28.
[5] In October 2,542,000 gallons wasted from 48-inch line in Brookline. In November 2,064,400 gallons wasted from 48-inch line in Brookline.
1897 — January: Cochituate, 61,331,300; Mystic, 14,516,487.

BOSTON WATER WORKS.

Diagram showing the rainfall and daily average Consumption for each month.

—Yearly Averages shown thus ---



HELIOTYPE PRINTING CO. BOSTON

TABLE II.

Diversion of Sudbury River Water, 1890-1896.

MONTH.	1890.	1891.	1892.		1893.	1894.		1895.		1896.	
	To Chestnut Hill Res'r.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
January	518,600,000	715,000,900	.....	630,800,000	1,325,900,000	.....	1,012,000,000	1,300,000	1,186,100,000	.....	1,367,300,000
February	475,000,000	560,800,000	.....	610,400,000	957,600,000	.....	944,000,000	.....	1,318,400,000	.....	1,346,900,000
March	498,600,000	573,200,000	45,100,000	625,200,000	1,023,900,000	529,100,000	947,100,000	680,000,000	1,115,800,000	.....	1,502,700,000
April	417,000,000	641,900,000	545,000,000	662,500,000	917,000,000	134,100,000	725,600,000	.....	982,300,000	300,000	1,252,800,000
May	536,300,000	740,300,000	114,700,000	690,490,000	858,600,000	215,800,000	826,500,000	87,700,000	931,500,000	35,200,000	1,101,300,000
June	513,100,000	629,500,000	197,500,000	779,300,000	856,700,000	80,700,000	875,500,000	114,000,000	941,100,000	.....	1,128,800,000
July	664,100,000	755,100,000	.....	948,000,000	1,040,800,000	.....	1,064,600,000	.....	1,061,900,000	.....	1,285,900,000
August	625,500,000	722,900,000	.....	897,700,000	994,100,000	.....	951,600,000	.....	1,147,600,000	.....	1,291,500,000
September	606,400,000	732,400,000	.....	876,300,000	948,300,000	.....	987,100,000	.....	1,142,800,000	.....	1,163,500,000
October	539,900,000	715,300,000	.....	908,500,000	956,600,000	1,100,000	958,500,000	6,600,000	951,700,000	.....	1,086,000,000
November	526,000,000	752,200,000	.....	788,000,000	862,700,000	400,000	1,021,000,000	5,600,000	998,600,000	.....	1,070,700,000
December	675,500,000	767,100,000	.....	1,216,100,000	995,700,000	1,000,000	1,137,100,000	1,600,000	1,130,700,000	.....	1,259,900,000
Totals	6,596,000,000	8,306,600,000	902,300,000	9,633,200,000	11,737,900,000	962,200,000	11,450,600,000	896,800,000	12,908,500,000	35,500,000	14,857,300,000
Total diversion from Sudbury river	6,596,000,000	8,306,600,000	10,535,500,000		11,737,900,000	12,412,800,000		13,805,300,000		14,892,800,000	
Average daily diversion for whole year.	18,071,200	22,757,800	28,800,000		32,158,600	34,007,700		37,822,700		40,690,700	

TABLE III.

Statement showing Amount of Water drawn from Lake Cochituate; Amount wasted; Amount of Rainfall collected in Lake; Amount received into Lake from Sudbury River; Percentage of Rainfall collected, etc., 1852 to 1896; Water-shed of Lake, 12,077 Acres.

YEAR.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Amount received into Lake from Sudbury River.	STORAGE.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1852[1]	2,974,042,800	4,020,566,900	.....	.....	261,360,000	6,733,249,700	18,396,900	47.93	20.61	43.
1853	3,117,939,500	3,166,417,500	.....	239,580,000	.....	6,523,937,000	17,873,800	55.73	19.51	35.
1854	3,614,230,000	4,187,733,000	.....	.....	217,800,000	7,584,163,000	20,778,500	43.15	22.87	53.
1855	3,776,399,500	No acc't kept.	.....	.....	326,700,000	.....	.....	34.96		
1856	4,409,787,600	"	.....	598,950,000	.....	.....	.....	40.80		
1857	4,644,990,000	10,625,900,000	.....	32,670,000	.....	15,303,560,000	41,927,600	63.10	46.69	74.
1858	4,689,155,000	1,934,500,000	.....	.....	141,570,000	6,482,085,000	17,759,000	48.66	19.46	40.
1859[2]	4,808,875,000	7,569,000,000	.....	283,140,000	.....	12,661,015,000	34,687,700	49.02	38.24	78.
1860	6,309,108,000	None.	.....	174,240,000	.....	6,483,348,000	17,714,100	55.44	19.40	35.
1861	6,639,095,900	3,377,559,000	.....	.....	1,459,260,000	8,557,394,900	23,444,900	45.44	25.45	56.
1862	6,059,000,000	33,200,000	.....	1,306,800,000	.....	7,399,000,000	20,271,200	49.69	22.36	45.
1863	5,927,052,500	2,165,696,500	.....	763,300,000	.....	8,855,049,000	24,260,400	69.30	26.88	39.
1864	6,105,306,700	1,368,746,000	.....	.....	1,848,577,000	5,625,475,700	15,370,200	42.60	18.35	43.
1865	4,621,630,000	1,688,120,700	.....	743,242,500	....	7,052,993,200	19,323,300	49.46	20.50	41.

1866.....	4,463,585,000	None.	.....	743,242,500	.....	5,206,827,500	14,265,300	62.32	16.01	26.
1867.....	4,951,225,000	2,482,041,000	.....	.....	698,811,000	6,734,455,000	18,450,600	56.25	21.80	39.
1868.....	5,405,515,000	2,507,684,000	.....	346,371,000	.....	8,259,570,000	22,567,200	49.71	24.98	50.
1869.....	5,503,751,000	1,635,570,000	.....	480,882,000	.....	7,620,203,000	20,877,300	64.34	21.99	34.
1870.....	5,477,810,000	4,818,971,000	.....	.....	1,736,085,000	8,560,696,000	23,453,900	55.89	26.08	47.
1871	5,223,500,000	None.	.....	.....	250,933,000	4,972,567,000	13,623,500	45.39	15.16	33.
1872	5,775,151,200	None.	1,676,666,400	1,543,995,500	.....	5,642,480,300	15,416,600	48.47	17.22	35.
1873.....	6,511,626,900	2,917,977,000	.....	.....	515,132,000	8,914,671,900	24,423,800	45.43	27.13	60.
1874.....	6,623,972,900	1,145,851,700	....	.....	1,367,715,000	6,402,109,600	17,540,000	35.93	19.52	54.
1875.....	7,992,955,500	None.	2,555,800,000	1,222,885,000	.....	5,760,040,500	15,780,900	45.49	17.57	39.
1876.....	7,277,175,200	1,619,243,800	2,528,300,000	43,438,000	.....	6,411,557,000	17,517,900	48.49	19.54	40.
1877.....	7,626,889,200	1,484,978,600	1,894,350,000	378,727,000	.....	7,596,244,800	20,811,600	43.80	23.17	53.
1878.....	437,904,700	3,341,875,000	2,668,300,000	219,789,000	.....	8,637,268,700	23,663,700	53.58	26.34	49.
1879.....	6,051,828,900	1,523,361,400	411,300,000	.....	1,322,697,300	5,841,203,000	16,003,300	38.01	17.81	47.
1880.....	4,284,147,100	65,577,700	826,700,000	.....	146,265,000	3,376,759,800	9,226,100	35.83	10.30	29.
1881.....	2,846,459,700	2,231,016,700	187,600,000	468,089,400	.....	5,357,965,800	14,679,400	41.09	16.34	40.
1882.....	3,9 35,490,600	1,358,543,700	.....	.....	357,334,700	4,936,669,600	13,525,200	40.29	15.05	37.
1883.....	4,731,227,700	162,361,800	1,245,100,000	.....	334,400,000	3,314,089,500	9,079,700	31.20	10.11	32.
1884.....	4,533,156,450	1,842,837,100	1,416,300,000	1,340,436,700	.....	6,300,130,250	17,213,450	45.57	19.21	42.
1885.....	4,091,674,900	1,006,622,800	.....	8,594,800	.....	5,106,892,500	13,991,500	43.66	15.57	36.
1886.... ...	4,432,536,100	3,116,283,200	.....	.....	360,662,000	7,188,157,300	19,693,600	46.97	21.92	47.

[1] Observations of rainfall at Lake Cochituate commenced 1852, and these observations are assumed as correct for the whole district.
[2] Lake raised two feet.

TABLE III.— *Concluded.*

Statement showing Amount of Water drawn from Lake Cochituate; Amount wasted; Amount of Rainfall collected in Lake; Amount received into Lake from Sudbury River; Percentage of Rainfall collected, etc., 1852 to 1896; Water-shed of Lake, 12,077 Acres.

Year.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Amount received into Lake from Sudbury River.	Storage.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1887.....	4,802,120,700	3,658,652,900	.....	.....	763,205,000	7,697,568,600	21,089,200	41.58	23.47	56.
1888.....	4,968,503,100	4,229,200,000	.....	959,309,000	.....	10,157,012,100	27,751,400	56.93	30.97	54.
1889..... ..	5,570,423,600	3,373,929,000	233,400,000	454,766,800	.....	9,165,719,400	25,111,600	50.23	27.95	56.
1890.....	5,722,170,800	2,380,441,200	.....	.....	64,166,300	8,038,445,700	22,023,100	51.23	24.51	48.
1891.....	5,508,178,900	6,064,000,000	.....	.....	1,056,057,800	10,516,121,100	28,811,300	46.42	32.07	69.
1892.....	5,464,791,300	281,000,000	902,300,000	200,284,300	.....	5,033,775,600	13,753,500	39.04	15.35	39.
1893.....	5,623,532,500	255,300,000	.....	.....	89,200,000	5,789,632,500	15,862,000	45.28	17.65	39.
1894.....	5,520,092,100	None.	962,200,000	.....	296,900,000	4,260,992,100	11,674,000	39.08	12.99	33.
1895.....	5,654,765,700	657,600,000	896,800,000	1,200,400,000	.....	6,615,965,700	18,125,900	48.96	20.17	41.
1896.....	5,731,790,000	1,907,000,000	35,500,000	.....	998,000,000	6,605,290,000	18,047,200	42.78	20.14	47.
Averages..	5,263,261,600	2,237,333,900	.....	.....	.....	7,099,590,300	19,438,600	47.43	21.59	45.

TABLE IV.

Statement showing Amount of Water diverted from Sudbury River to Lake Cochituate and Chestnut Hill Reservoir; Amount wasted; Amount of Flow in River; Percentage of Rainfall collected, etc., 1875 to 1896.

(Water-shed from 1875 to 1878, inclusive,=77.761 sq. miles; in 1879 and 1880=78.238 sq. miles; and from 1881 to 1896, inclusive,=75.2 sq. miles.)

YEAR.	Amount of Water diverted to Lake Cochituate and Chestnut Hill Reservoir	Amount of Water used by Framingham Water Co.	Amount of Water wasted from River.	STORAGE.		Total Amount of Flow in River	Daily average Amount of Flow in River.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1875	2,555,800,000	.....	24,971,600,000	66,300,000	.....	27,593,700,000	75,599,200	45.490	20.418	44.88
1876	2,528,300,000	.....	29,942,300,000	.....	160,700,000	32,309,900,000	88,278,400	49.563	23.908	48.24
1877	1,894,350,000	.....	32,438,300,000	112,100,000	.....	34,444,750,000	94,369,200	44.018	25.847	57.90
1878	3,422,100,000	.....	37,125,200,000	654,700,000	.....	41,202,000,000	112,882,200	57.931	30.487	52.63
1879	3,749,200,000	.....	20,817,500,000	962,200,000	.....	25,528,900,000	69,942,200	41.419	18.775	45.33
1880	6,230,200,000	.....	11,290,000,000	.....	958,600,000	16,561,600,000	42,250,300	38.177	12.182	31.91
1881	8,845,300,000	.....	17,279,000,000	751,700,000	.....	26,876,000,000	73,633,900	44.160	20.565	46.56
1882	7,735,200,000	.....	16,273,900,000	.....	352,600,000	23,656,600,000	64,812,300	39.394	18.102	45.95
1883	8,455,000,000	.....	7,251,900,000	.....	1,086,400,000	14,620,500,000	40,056,200	32.780	11.188	34.13
1884	6,110,600,000	.....	23,228,900,000	1,744,600,000	.....	31,084,100,000	84,929,200	47.135	23.784	50.46
1885	5,224,700,000	61,800,000	19,878,800,000	.....	446,900,000	24,718,400,000	67,721,600	43.545	18.916	43.44
1886	5,266,600,000	76,600,000	23,023,000,000	1,464,500,000	.....	29,831,700,000	81,730,700	46.065	22.825	49.55
1887	6,124,100,000	87,500,000	25,334,500,000	117,400,000	.....	31,663,500,000	86,749,300	42.705	24.227	56.73

TABLE IV.—*Concluded.*

Statement showing Amount of Water diverted from Sudbury River to Lake Cochituate and Chestnut Hill Reservoir; Amount wasted; Amount of Flow in River; Percentage of Rainfall collected, etc., 1875 to 1896.

(Water-shed from 1875 to 1878, inclusive,=77.764 sq. miles; in 1879 and 1880=78.238 sq. miles; and from 1881 to 1896, inclusive,=75.2 sq. miles.)

Year.	Amount of Water diverted to Lake Cochituate and Chestnut Hill Reservoir.	Amount of Water used by Framingham Water Co.	Amount of Water wasted from River.	Storage.		Total Amount of Flow in River.	Daily average Amount of Flow in River.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1888.....	7,224,700,000	61,500,000	39,040,500,000	390,600,000	.....	46,717,300,000	127,642,900	57.465	35.749	62.21
1889.....	6,363,900,000	59,500,000	31,550,400,000	.....	2,800,000	37,971,000,000	104,030,100	49.95	29.056	58.17
1890.....	6,596,000,000	74,500,000	28,667,100,000	.....	57,400,000	35,280,200,000	96,658,100	53.00	26.998	50.94
1891.....	8,306,600,000	80,500,000	28,799,600,000	.....	1,100,800,000	36,085,900,000	98,865,500	49.52	27.612	55.76
1892.....	10,535,500,000	82,800,000	11,143,000,000	....	257,700,000	21,503,600,000	58,753,000	41.83	16.456	39.34
1893.....	11,737,900,000	103,000,000	17,4 5,500,000	.....	789,800,000	28,456,600,000	77,963,300	48.225	21.774	45.15
1894.....	12,412,800,000	117,000,000	6,715,900,000	1,901,600,000	....	21,147,300,000	57,937,800	39.740	16.182	40.72
1895.. ...	13,805,300,000	132,200,000	15,545,600,000	1,137,920,000	.....	31,621,000,000	86,632,900	50.62	24.196	47.80
1896.....	14,892,800,000	139,300,000	15,528,600,000	....	2,522,500,000	28,038,200,000	76,607,100	43.70	21.453	49.09
Averages	7,273,543,200	89,683,300	21,965,831,800	.....	.....	29,404,993,200	80,365,400	45.75	22.288	48.04

TABLE V.

Statement showing Amount of Water drawn from Mystic Lake; Amount wasted; Amount of Rainfall collected in Lake; Percentage of Rainfall collected, etc., 1876 to 1896; Water-shed of Lake, 17,200 Acres.

YEAR.	Amount of Water drawn from Lake.	Amount of Water wasted fram Lake.	STORAGE.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
			Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1876	3,230,101,300	6,369,774,700	.....	32,583,000	9,567,293,000	26,140,100	47.00	20.49	43.6
1877	3,069,554,800	7,250,223,500	.....	16,291,400	10,303,486,900	28,228,700	43.095	22.06	51.2
1878	3,367,490,400	8,718,547,600	.....	26,000,000	12,060,038,000	33,041,200	64.065	25.82	47.8
1879	3,490,848,200	4,625,691,800	.....	203,000,000	7,913,540,000	21,680,900	35.30	16.94	48.0
1880	3,692,195,700	2,158,761,200	.....	113,500,000	5,703,756,900	15,584,000	34.42	12.21	35.5
1881	2,815,579,900	5,534,300,000	371,200,000	.....	8,721,079,900	23,893,400	41.91	18.67	44.5
1882	2,570,896,700	4,444,668,000	15,000,000	.....	7,030,564,700	19,261,800	39.165	15.05	38.4
1883	2,664,514,200	2,034,702,600	.....	347,579,000	4,351,637,800	11,922,300	31.22	9.32	29.84
1884	2,469,761,000	6,574,003,800	380,600,000	.....	9,424,364,800	25,749,600	44.39	20.18	45.46
1885	2,639,278,800	5,558,860,500	.....	33,200,000	8,194,939,300	22,451,900	44.50	17.55	39.43
1886	2,862,947,500	7,743,258,900	.....	28,400,000	10,577,806,400	28,980,300	45.56	22.65	49.71
1887	2,954,257,500	7,414,213,000	.....	11,000,000	10,357,470,500	28,376,600	46.42	22.17	47.77
1888	3,205,121,100	11,334,593,100	.....	6,000,000	14,533,714,200	39,709,600	56.745	31.12	54.84
1889	3,007,539,800	8,879,787,500	12,000,000	.....	11,899,327,300	32,600,900	50.395	25.48	50.56

TABLE V. — *Concluded.*

Statement Showing Amount of Water drawn from Mystic Lake; Amount wasted; Amount of Rainfall collected in Lake; Percentage of Rainfall collected, etc., 1876 to 1896; Water-shed of Lake, 17,200 Acres.

Year.	Amount of Water drawn from Lake.	Amount of Water Wasted from Lake.	Storage.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
			Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1890	3,212,284,500	8,953,727,900	.....	3,000,000	12,163,012,400	33,323,300	49.37	26.04	52.75
1891	3,500,817,500	10,027,714,400	.....	171,000,000	13,357,531,900	36,600,000	47.40	28.60	60.34
1892	3,811,766,200	3,474,213,200	177,000,000	.....	7,462,979,400	20,390,700	39.115	15.98	40.85
1893	4,331,743,200	4,958,528,500	.....	95,000,000	9,195,271,700	25,192,500	44.20	19.69	44.54
1894	3,996,805,100	2,752,964,200	.....	23,000,000	6,726,769,300	18,429,500	39.24	14.40	36.70
1895	3,682,848,300	4,528,156,200	156,000,000	.....	8,367,004,500	22,923,300	48.73	17.91	36.8
1896	4,617,704,600	4,559,437,400	.....	45,000,000	9,132,142,000	24,951,200	39.90	19.55	49.0
Averages	3,294,955,100	6,091,720,400	.....	.....	9,383,034,800	25,687,000	43.91	20.09	45.1

TABLE VI.

Average Maximum and Minimum Monthly and Yearly Heights, in Feet, above Tide Marsh Level, to which Water would rise at different Stations on the Boston Water Works.

1896.	Boston Common.		Engine-house No. 8, Salem street.		Engine-house No. 7, East street.		Engine-house No. 38, Congress street, So. Boston.		Engine-house No. 2, Fourth street, So. Boston.		Pumping Station, Condor street, East Boston.		Engine-house No. 9, Paris street, East Boston.		Engine-house No. 16, River street, Dorchester.		Engine-house No. 32, Bunker Hill street, Charlestown, Mystic supply.		710 Albany street.		City Hall High service.		Engine-house No. 18, Harvard street, Dorchester. High service.	
Month.	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*
Jan.....	110.8	94.2	107.1	87.8	108.0	90.4	108.6	90.7	106.1	86.8	104.8	83.8	98.2	70.3	108.8	88.1	[3]101.9 132.0	79.2 117.7	114.3	95.1	232.5	208.8	228.4	200.3
Feb.....	111.0	94.7	106.9	88.6	107.3	91.5	109.7	90.0	105.6	86.6	104.2	84.8	97.7	71.0	109.2	89.0	131.9	117.1	111.1	95.2	233.0	206.5	229.6	203.2
March..	112.7	96.0	113.3	94.9	107.5	91.9	111.0	92.7	108.5	89.2	107.4	85.9	102.4	73.1	110.0	90.1	135.1	119.6	113.9	96.7	232.8	207.2	230.3	201.1
April....	116.7	98.1	117.6	96.6	113.9	93.7	115.6	95.0	113.9	92.3	112.0	88.1	111.0	78.1	114.6	91.4	140.1	120.3	116.9	98.9	235.4	210.1	230.2	197.1
May.....	117.8	96.9	118.4	95.3	114.2	93.7	116.7	95.1	114.9	91.2	114.6	88.8	110.6	74.8	116.6	91.1	141.1	121.0	117.8	98.9	234.7	211.8	229.1	181.5
June.....	117.8	97.4	118.4	96.4	113.1	93.6	116.1	94.0	114.9	90.6	114.2	87.2	110,6	76.1	116.4	91.5	141.5 [3]112.5	121.2 82.6	117.6	98.9	[4]237.3	225.7	226.7	190.5
July.....	116.7	94.7	116.5	92.4	112.0	91.5	115.4	93.1	114.5	91.4	110.9	85.6	109.7	73.0	114.7	86.7	141.2	119.5	117.3	98.1	237.8	226.6	228.4	181.6
August...	116.1	93.2	116.3	91.7	112.9	91.3	115.5	92.0	114.0	90.0	110.3	84.1	108.7	70.7	114.8	86.6	[3]112.4	81.7	116.8	97.3	237.5	228.2	230.3	194.4
Sept.....	116.8	96.1	116.9	96.0	.....	.....	115.9	95.3	114.8	92.5	110.0	86.8	110.5	76.4	[2]116.0	95.7	[3]112.9	85.4	117.1	99.2	[5]238.1	230.0	[5]231.7	201.7
Oct.....	118.0	98.9	118.7	99.1	114.6	96.6	116.9	97.6	115.6	95.5	113.4	91.1	[1]113.8	84.5	116.9	97.9	141.3	123.1	118.4	101.7	213.0 [5]211.7	204.0 203.5	211.9 [5]210.7	189.4 184.4
Nov.....	117.8	99.5	118.3	98.2	114.4	96.3	116.6	96.8	115.4	95.8	113.5	90.2	114.4	88.3	116.4	98.5	141.8	124.1	118.0	101.5	239.5	228.2	231.4	197.0
Dec	115.3	96.2	114.5	94.6	112.8	93.1	112.9	94.9	111.0	90.3	108.6	85.9	108.6	82.9	112.6	94.1	136.8	119.0	115.5	98.1	238.9	231.8	231.2	202.1
Avrag's.	115.6	96.3	115.2	94.3	111.8	93.0	114.2	93.9	112.4	91.0	110.3	86.9	.....	.....	.....	.....	.....	.....	116.2	98.3				

[1] 20-in L. S. main laid from Condor st., through Border st., to Central sq. [2] 24-in. pipe, extended to Adams and Parkman sts.
[3] Charlestown, supplied from Cochituate. [4] 48-in. H. S. main, completed to Common. [5] 48-in. H. S. main, out of service.

TABLE VII.

Statement of Operations at Chestnut Hill Pumping Station for the Year 1896.

1896.	Engine No. 1.			Engine No. 2.			Total amount pumped, 2 per cent being allowed for slip.	Daily average amount pumped.	Total amount of coal consumed.	Daily average amount of coal consumed.	Total amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal. No correction for lighting or heating.	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal.
	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.									
Month.	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gals.*	*Feet.*	*Ft.-Lbs.*
January	114	50	40,481,375	104	25	37,903,075	78,384,450	13,064,100	107,733	17,955	9,220	8.6	727.6	123.18	74,745,900
February	5	00	1,733,125	.....	....	.....	1,733,125	1,733,125	2,900	2,900	400	13.9	598.0	120.0	59,810,700
March	82	45	31,370,300	60	30	23,091,125	54,461,425	13,615,400	72,618	18,155	6,105	8.4	750.0	120.40	75,307,500
April	257	20	97,150,875	191	20	71,069,925	168,220,800	12,940,100	210,159	16,166	19,165	9.1	800.4	120.89	80,702,700
May															
June															
July															
August	21	15	7,866,175	14	40	5,326,225	13,192,400	13,192,400	15,095	15,095	1,455	9.6	873.9	123.23	87,412,200
September	310	20	118,109,150	344	15	132,146,725	250,255,875	13,903,100	276,817	15,380	29,810	10.8	904.5	120.62	65,288,900
October															
November	13	15	4,849,800	43	25	16,840,075	21,689,875	7,230,000	30,065	10,022	3,375	11.2	721.4	119.15	71,688,000
December															
Tot'ls and av'ages.	804	45	301,560,800	758	35	286,377,150	587,937,950	12,781,260	715,387	15,552	69,530	9.7	821.8	121.07	82,983,700

TABLE VII.—*Concluded.*

Statement of Operations at Chestnut Hill Pumping Station for the Year 1896.

1896.	ENGINE NO. 3.											SUMMARY. ENGINES 1, 2 AND 3.		
	Total pumping time.		Amount pumped.	Daily average amount pumped.	Amount of coal consumed.	Daily average amount consumed	Amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal; no correction for heating or lighting.	Average lift of water.	Duty in ft.-lbs. per 100 lbs. of coal; no correction for heating or lighting.	Total amount pumped.	Daily average amount pumped.	REMARKS.
Month.	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gallons.*	*Feet.*	*Ft.-Lbs.*	*Gallons.*	*Gallons.*	
January...	511	50	355,453,300	13 164,900	346,555	12,835	38,769	11.2	1,025.5	123.53	105,669,300	433,837,750	13,994,800	
February..	567	50	405,341,700	13,977,300	417,921	14,411	44,160	10.6	969.9	122.86	99,381,100	407,074,825	14,037,100	
March.....	524	35	372,526,000	13,797,300	371,857	13,772	40,830	10.9	1,001.8	123.06	102,816,700	426,987,425	13,773,800	
April.....	347	20	251,742,400	13,985,700	236,643	13,147	25,595	10.8	1,063.8	124.67	110,609,000	419,963,200	13,998,800	
May.....	627	10	451,115,000	14,552,100	399,932	12,901	44,100	11.0	1,127.9	122.88	115,597,500	451,115,000	14,552,100	Engines 1 and 2 did not run.
June.....	638	05	458,738,000	15,291,300	398,467	13,282	45,186	11.3	1,151.3	123.83	118,895,200	458,738,000	15,291,300	Engines 1 and 2 did not run.
July.....	590	50	478,242,800	15,427,200	433,125	13,972	46,610	10.7	1,104.4	124.32	114,483,300	478,242,800	15,427,200	Engines 1 and 2 did not run.
August....	597	30	429,350,600	14,311,700	391,645	13,054	46,525	11.9	1,096.3	121.12	110,739,200	442,543,000	14,275,600	
September	229	15	164,840,200	13,736,700	148,945	12,412	19,065	12.8	1,106.7	123.07	113,594,000	415,096.075	13,836,500	
October....	555	25	399,257,600	12,879,300	395,638	12,762	48,465	12.3	1,009.2	122.86	103,402,700	399,257,600	12,879,300	Engines 1 and 2 did not run.
November.	528	51	381,551,800	13,157,000	395,665	13,644	41,736	10.5	964.3	123.43	99,268,800	403,241,675	13,441,400	
December.	676	20	446,713,400	14,410,100	491,275	15,848	45,295	9.2	909.3	122.31	92,754,000	446,713,400	14,410,100	Engines 1 and 2 did not run.
Totals and av'gs	6,395	01	4,594,872,800	14,094,700	4,427,668	13,581	486,336	11.0	1,037.8	123.16	106,582,100	5,182,810,750	14,160,700	

TABLE VIII.

Statement of Operations at Mystic Pumping Station for the Year 1896.

1896.	Engine No. 1.			Engine No. 2.			Engine No. 3.			Total amount pumped.	Daily average amount pumped.	Total amount of coal consumed.	Daily average amount of coal consumed.	Total amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal. No correction for lighting or heating.	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal. No correction for lighting or heating.
	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.									
Month.	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gallons.*	*Feet.*	*Ft.-Lbs.*
January.....	354	45	77,622,700	.....	... ..	.....	668	30	226,225,700	303,848,400	9,801,600	737,500	23,790	83,435	11.3	412.0	146.82	50,448,100
February	225	30	50,337,100	.....	.....	.....	683	30	231,707,100	282,044,200	9,725,700	685,500	23,638	74,471	10.9	411.4	148.44	50,936,200
March.....	232	00	49,483,600	.....	.....	.....	715	15	241,006,100	290,489,700	9,370,600	711,000	22,936	78,907	11.1	408.6	146.79	50,017,700
April.....	90	15	17,602,700	.....	.....	.....	568	45	187,281,900	204,884,600	6,829,500	498,000	16,600	60,538	12.2	411.4	146.13	50,140,200
May.....	121	30	28,257,900	.....	.....	.....	290	45	93,556,200	121,814,100	4,872,600	317,500	11,760	36,045	11.4	383.7	145.31	46,496,000
June	426	30	91,783,300	.....	.....	.....	682	00	235,150,900	326,934,700	11,273,600	761,000	25,367	85,106	11.2	429.6	145.27	52,049,700
July.....	173	45	37,864,200	198	30	42,196,000	720	00	247,638,000	327,698,200	10,570,900	750,500	25,017	90,838	12.1	436.6	144.25	52,529,800
August.....	15	15	2,335,700	190	45	39,550,500	739	00	252,445,200	294,331,400	9,494,600	686,000	22,129	84,763	12.4	429.1	144.97	51,874,800
September ...	.....	.....	.....	184	15	38,396,300	673	00	235,273,700	273,670,000	9,122,300	644,000	21,467	78,355	12.2	424.9	144.79	51,315,200
October	119	15	24,166,000	188	30	37,492,400	299	45	104,580,600	166,239,000	5,937,100	437,500	15,625	51,394	12.0	380.0	145.06	45,969,400
November....	58	30	13,100,800	43	00	8,575,600	110	45	40,162,300	61,838,700	3,435,500	184,870	7,110	22,020	11.9	334.5	144.77	40,293,900
December....	145	00	29,177,400	220	45	41,793,800	339	30	127,249,400	198,220,600	6,835,200	494,500	16,483	59,518	12.0	400.5	145.99	48,805,800
Totals and averages.	1,962	15	421,731,900	1,030	45	208,004,600	6,540	45	2,222,277,100	2,852,013,600	7,792,400	,907,870	18,874	805,390	11.7	412.9	145.72	50,175,600

TABLE VIII. — *Concluded.*

Statement of Operations at Mystic Pumping Station for the year 1896.

1896.	ENGINE NO. 4.											SUMMARY OF ENGINES 1, 2, 3 and 4.		
	Total pumping time.		Amount pumped.	Daily average amount pumped.	Amount of coal consumed.	Daily average amount consumed.	Amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal.*	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal.*	Total amount pumped.	Daily average amount pumped.	Remarks.
Month.	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gals.*	*Feet.*	*Ft.-Lbs.*	*Gallons.*	*Gallons.*	
January.....	263	30	114,542,200	4,090,800	149,500	5,339	17,173	11.5	766.2	151.94	97,087,300	418,390,600	13,496,500	
February....	301	00	131,647,200	5,063,400	153,500	5,903	18,804	12.2	857.6	153.10	109,507,700	413,691,400	14,265,200	
March	292	45	129,966,500	5,198,700	152,900	6,116	15,189	9.9	850.0	154.30	109,382,400	420,456,200	13,563,100	
April	365	45	162,846,600	6,031,400	189,500	7,018	15,662	8.3	859.3	150.50	105,407,600	367,731,200	12,257,700	
May.....	562	15	252,942,400	9,033,700	298,500	10,661	31,248	10.5	847.4	152.18	107,547,700	374,756,500	12,088,900	
June.....	109	00	47,911,700	5,323,500	59,100	6,567	7,089	12.0	810.7	154.64	104,554,300	374,846,400	12,494,900	
July	25	00	10,714,600	5,357,300	12,500	6,250	1,212	9.7	857.2	154.91	110,741,800	338,412,800	10,916,500	
August.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	294,331,400	9,494,600	Engine did not run.
September...	28	15	12,192,800	3,048,200	13,000	3,250	1,300	10.0	938.0	154.85	121,126,000	285,862,800	9,528,800	
October.....	413	00	183,708,600	6,561,000	216,000	7,714	27,961	12.8	850.5	153.39	108,802,500	349,947,600	11,288,600	
November...	603	45	268,665,400	9,595,200	313,000	11,179	40,815	13.0	858.4	150.18	105,062,000	330,504,100	11,016,800	
December...	466	15	207,461,300	7,409,300	234,600	8,379	28,411	12.1	884.3	149.71	110,414,600	405,6 81,900	13,086,500	
Totals and averages.	3,430	30	1,522,599,300	6,534,800	1,792,100	7,691	204,864	11.4	849.6	152.70	108,200,300	4,374,612,900	11,952,500	

*No correction for lighting or heating.

TABLE IX.

Statement of Operations at the East Boston Pumping Station for the Year 1896.

1896.	ENGINES NOS. 1 AND 2.				ENGINE NO. 3.				Total amount of coal consumed.	Per cent of ashes and clinkers.
	Total pumping time.		Total amount pumped to reservoir.	Daily average.	Total pumping time.		Total amount pumped to tank.	Daily average.		
Month.	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*
Jan....	426	15	18,390,820	593,200	131	30	2,049,360 1 578,620	66,100	53,340	18.1
Feb	401	25	16,446,920	567,100	135	05	2,099,940 1 781,480	92,400	51,120	17.9
March .	418	40	16,034,620	517,200	113	50	1,713,300	80,500	47,910	17.9
April ..	337	25	14,037,100	467,900	108	30	1,664,520	55,500	39,490	17.9
May ...	353	35	15,305,080	493,700	104	30	1,659,780	53,500	40,032	17.6
June...	336	25	14,409,920	480,300	106	00	1,686,420	56,200	38,500	17.5
July ...	339	55	14,347,060	462,800	118	05	1,851,480	59,700	40,980	17.8
Aug....	338	25	14,503,160	467,800	113	45	766,240	57,300	40,730	17.8
Sept....	304	45	12,820,080	427,300	97	30	1,404,990	46,800	35,885	17.9
Oct	315	00	12,842,760	414,300	90	30	1,261,470	40,700	36,150	18.1
Nov....	312	15	12,915,700	430,500	83	30	1,121,640	37,400	37,880	18.9
Dec....	355	00	14,731,220	475,200	96	30	1,404,540	45,300	47,000	20.0
Tot'ls& Avrg's,	4,239	05	176,784,440	483,000	1,799	15	21,053,780	57,600	508,017	18.1

[1] This amount was pumped to the tank by Engine 2.
Engines Nos. 1 and 2 pump to the reservoir.
Engine No. 3 pumps to the tank on Breed's Island.

TABLE X.

Statement of Operations at the West Roxbury Pumping Station for the Year 1896.

1896.	Total pumping time.		Total amount pumped.	Daily average amount pumped.	Quantity pumped per lb. of coal.	Total amount of coal consumed.	Per cent of ashes and clinkers.	Average lift.
Month.	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*	*Feet.*
January	526	30	6,963,675	224,600	149.3	46,625	18.9	139.96
February	492	00	6,644,925	229,100	152.8	43,500	18.7	139.46
March	491	00	6,828,750	220,300	162.7	41,975	17.1	140.65
April.....	498	30	6,912,525	230,400	168.8	40,950	16.4	139.47
May.....	644	30	8,045,842	259,500	159.9	50,300	18.4	143.57
June	664	30	8,238,950	274,600	156.5	52,650	18.3	157.08
July	709	00	9,050,992	292,000	158.7	57,000	19.5	131.08
August	793	00	9,788,475	315,800	177.9	55,000	21.1	141.08
September ...	725	00	7,137,030	237,900	151.6	47,075	20.9	139.02
October	680	00	7,255,785	234,100	153.4	47,285	19.8	145.36
November ...	651	00	7,078,695	236,000	152.9	46,300	21.0	144.62
December....	676	00	7,740,750	249,700	156.1	49,575	21.5	138.85
Totals and averages,	7,551	00	92,684,694	253,200	158.4	578,235	19.3	141.68

TABLE XI.

Rainfall in Inches and Hundredths on Sudbury River Water-shed for the Year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	.....	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	0.540	.....	.....	.....	0.940	.....	0.060	.....	.....
3	0.015	.....	1.420	.....	0.035	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	0.165	.....	.....	.....	.....	.....	0.460	.....	.....	0.040
5	.....	.....	.....	.....	0.130	.....	0.315	.....	.....	.....	1.110	.....
6	.....	2.515	.....	.....	.....	.....	.....	1.030	3.145	0.565	.....	.....
7	0.185	.....	0.315	0.095	.....	.....	.....	.....	.....	0.095	.....	.....
8	.....	.....	.....	.....	.....	.....	0.305	.....	.....	.....	0.135	.....
9	.....	0.570	.....	.....	0.020	0.655	0.010	.....	.....	.....	.....	0.980
10	0.570	.....	.....	.....	.....	0.690	.....	.....	1.390	.....	.....	.....
11	.....	0.025	.....	.....	0.045	.....	.....	.....	.....	.....	0.100	.....
12	0.040	.....	0.775	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	.....	0.480	.....	.....	.....	.....	0.010	.....	.....	1.445	0.155	.....
14	.....	.....	.....	.....	.....	.....	.....	0.030	0.295	.....	.....	.....
15	.....	.....	.....	.....	.....	1.735	.....	.....	.....	0.470	.....	.....
16	.....	0.055	.....	.....	.....	.....	0.915	.....	.....	.....	.....	0.700
17	.....	.....	1.295	.....	.....	0.060	.....	0.030	0.180	.....	.....	.....
18	.....	.....	.....	0.430	.....	.....	.....	0.025	.....	0.085	.....	0.070
19	.....	0.425	.....	0.200	0.625	.....	.....	0.010	1.175	.....	.....	.....
20	0.035	.....	1.085	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	.....	.....	.....	.....	0 090	0.060	0.150	.....	.....	0.030	0.445	.....
22	.....	.....	.....	0.305	.....	.....	.....	0.115	0.080	.....	.....	.....
23	.....	.....	.....	.....	.....	.....	0.115	.....	.....	.....	.....	0.335
24	.....	.....	0.025	.....	.....	.....	.....	0.130	.....	0.990	0.025	.....
25	.....	.....	.....	.....	.....	.....	0.495	.....	.....	.....	.....	.....
26	1.520	.....	.....	.....	0.135	.....	.....	.....	.....	.....	0.325	.....
27	.....	.....	.....	.....	.....	.....	0.050	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....	0.020	0.010	.....	.....	.....	0.225	.....
29	.....	1.865	.....	.....	0.830	.....	.....	.....	.....	.....	0.390	.....
30	.....	.....	0.925	.....	.....	.....	0.135	.....	0.995	0.025	0.110	.....
31	.....	.....	.....	.....	0.665	.....	.....	0.085	.....	.....	.....	.....
Totals	2.365	6.435	6.005	1.570	2.575	3.220	2.510	2.395	7.720	3.765	3.020	2.125

Total rainfall during the year, 43.705 inches, being an average of two gauges located at Framingham and Ashland.

TABLE XII.

Rainfall in Inches and Hundredths at Lake Cochituate for the Year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	.....	0.500	0.660	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	0.580	.....	.....	.....	1.050	.....	0.060	.....	.....
3	0.010	0.030	0.640	.....	0.030	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	0.290	.....	.....	.....	.....	.....	0.430	.....	.....	0.030
5	.....	.....	.....	.....	0.070	.....	0.210	0.550	.....	.....	1.000	.....
6	.....	2.290	.....	.....	.....	.....	.....	0.060	3.600	0.400	.....	.....
7	0.180	.....	0.310	0.040	.....	.....	0.220	.....	.....	0.100	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.190	.....
9	.....	0.510	.....	.....	0.020	0.710	.....	.....	.....	.....	.....	0.920
10	0.730	.....	.....	.....	.....	0.580	.....	0.130	1.480	.....	.....	.....
11	.....	0.020	.....	.....	0.060	.....	.....	.....	.....	.....	0.080	.....
12	0.050	.....	0.780	.....	.....	.....	.....	.....	.....	.....	0.010	.....
13	.....	0.560	.....	.....	.....	.....	.....	.....	.....	.....	0.230	.....
14	.....	.....	.....	.....	.....	.....	.....	.....	0.460	.....	.....	.....
15	.....	.....	.....	.....	.....	1.600	0.450	.....	.....	1.790	.....	.....
16	.....	0.070	1.250	.....	.....	.....	0.200	0.060	.....	.....	.....	0.860
17	.....	.....	.....	0.220	.....	0.050	.....	.....	0.160	.....	.....	.....
18	.....	0.200	.....	.....	.....	.....	.....	0.050	.....	0.120	.....	0.150
19	.....	0.180	1.030	0.370	0.470	.....	.....	0.200	0.790	.....	.....	.....
20	0.010	.....	.....	.....	.....	.....	.....	.....	0.370	.....	.....	.....
21	.....	.....	.....	.....	0.070	0.070	0.220	0.120	.....	0.030	0.440	.....
22	.....	.....	.....	.....	.....	.....	0.130	0.020	0.100	.....	.....	.....
23	.....	.....	0.020	0.380	.....	.....	.....	.....	.....	.....	.....	0.290
24	.....	.....	.....	.....	.....	.....	.....	0.110	.....	0.980	0.040	.....
25	.....	.....	.....	.....	.....	.....	0.550	.....	.....	.....	0.260	.....
26	1.450	.....	0.010	.....	0.160	.....	.....	.....	.....	.....	.....	.....
27	.....	.....	.....	.....	.....	.....	0.120	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....	0.030	.....	.....	.....	.....	0.530	.....
29	.....	1.680	.....	.....	0.800	.....	.....	.....	.....	0.020	.....	.....
30	.....	.....	0.870	.....	.....	.....	0.120	.....	0.820	0.030	0.220	.....
31	.....	.....	.....	.....	0.590	.....	.....	0.080	.....	.....	.....	.....
Totals....	2.430	6.040	5.860	1.600	2.270	3.040	2.220	2.430	8.210	3.530	3.000	2.150

Total rainfall during the year, 42.780 inches.

TABLE XIII.

Rainfall in Inches and Hundredths on Mystic Lake Water-shed for the year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	.....	0.625	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	1.070	.....	0.040	.....	0.110
3	0.010	.....	1.430	0.675	0.010	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	0.555	.....	.....	.....
5	.....	.....	.....	.....	0.030	.....	0.215	.....	.....	0.155	.....	0.150
6	.....	2.260	.....	.....	.....	.....	.....	0.670	3.595	.....	1.010	.....
7	0.165	.....	0.290	0.025	.....	.....	0.265	.....	0.140	0.350	.....	.....
8	.....	.....	.....	.....	0.025	.....	0.095	0.170	.....	.....	0.380	.....
9	.....	0.400	.....	.....	.....	0.650	.....	.....	.....	.....	.....	1.195
10	0.535	.....	.....	.....	.....	0.455	.....	.....	1.550	.....	.....	.....
11	.....	.....	.....	.....	0.080	.....	.....	.....	.....	.....	0.065	.....
12	0.035	.....	0.500	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	.....	0.520	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	.....	0.115	0.930	0.375	.....
15	.....	.....	.....	.....	.....	1.070	.....	.....	.....	0.395	.....	.....
16	.....	.....	.....	.....	.....	.....	0.330	0.035	.....	.....	.....	0.590
17	.....	.....	1.100	.....	.....	0.025	.....	.....	.....	.....	.....	.....
18	.....	.....	.....	0.245	.....	.....	.....	0.080	.....	0.145	.....	0.035
19	0.005	.....	.....	0.250	0.400	.....	.....	0.160	.....	.....	.....	.....
20	.....	0.430	0.630	.....	.....	.....	.....	.....	1.155	.....	.....	.....
21	.....	.....	.....	.....	0.035	0.120	0.305	.....	.....	0.025	.....	.....
22	.....	.....	.....	.....	.....	.....	.....	0.110	.....	.....	0.390	.....
23	.....	.....	0.010	0.580	.....	.....	0.075	.....	0.110	.....	.....	0.250
24	.....	.....	.....	.....	.....	.....	.....	0.285	.....	1.095	0.060	.....
25	.....	.....	.....	.....	.....	.....	0.750	.....	.....	.....	.....	.....
26	1.125	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.315	.....
27	.....	.....	.....	.....	0.200	.....	0.120	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....	0.025	.....	.....	.....	.....	.....	.....
29	.....	0.610	.....	.....	0.700	.....	.....	.....	.....	0.050	0.555	.....
30	.....	.....	0.830	.....	.....	.....	0.265	.....	0.665	0.035	0.170	.....
31	.....	.....	.....	.....	0.530	.....	.....	0.030	.....	.....	.....	.....
Totals	2.355	4.845	4.790	1.775	2.010	2.345	2.420	2.610	7.885	3.220	3.320	2.33

Total rainfall during the year, 39.905 inches, being an average of two gauges, located at Mystic Lake and Mystic Reservoir.

TABLE XIV.

Monthly Rainfall in Inches during 1896 at Various Places in Eastern Massachusetts.

PLACE.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Framingham	2.43	5.85	5.91	1.85	2.83	3.14	2.14	2.74	7.39	3.84	2.92	2.17	43 21
Dam 4, Ashland	2.30	7.02	6.10	1.29	2.32	3.30	2.88	2.05	8.05	3.69	3.12	2.08	44.20
Cordaville	2.47	6.12	5.07	1.42	2.67	3.45	2.39	2.39	6.71	3.88	3.29	1.94	41.80
Lake Cochituate	2.43	6.04	5.86	1.60	2.27	3.04	2.22	2.43	8.21	3.53	3.00	2.15	42.78
Chestnut Hill	2.80	5.45	5.53	1.72	1.85	2.98	3.00	2.74	7.16	3.49	3.61	1.89	42.22
Mystic Lake	2.77	5.09	5.19	1.99	2.13	2.51	2.45	2.90	7.78	3.37	3.56	2.39	42.13
Winchester	1.94	4.60	4.39	1.56	1.89	2.18	2.39	2.32	7.99	3.07	3.08	2.27	37.68
Mystic Pumping Station	2.72	5.08	5.12	2.00	1.85	2.32	2.53	2.81	7.07	3.11	3.62	2.36	40.59
Cambridge Observatory	3.06	4.35	6.27	1.66	2.04	2.15	2.87	2.13	6.18	3.11	3.34	1.57	38.73
Waltham, Boston Manufacturing Company	2.77	4.56	6.29	2.15	2.01	2.65	2.54	2.35	7.22	3.23	3.41	1.24	40.42
Lowell, Locks and Canals Company	2.24	4.95	6.53	1.34	2.32	2.68	3.79	2.76	9.69	2.99	3.02	2.13	44.44
Average of above eleven places	2.54	5.37	5.66	1.69	2.20	2.76	2.65	2.51	7.59	3.40	3.27	2.02	41.65

TABLE XV.

Table showing the Temperature of Air and Water of Various Stations on the Water-Works.

	Temperature of Air.						Temperature of Water.	
	Chestnut-Hill Reservoir.			Framingham.			Brookline Reservoir.	Mystic Engine-house
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Mean.	Mean.
January	45.5°	-11.5°	23.2°	42.0°	-11.0°	22.7°	35.2°	26.3°
February	55.5	-13.0	28.8	54.0	-12.0	27.5	35.7	31.2
March	66.0	7.0	32.1	63.0	7.0	31.8	35.9	31.9
April	87.0	23.0	48.4	86.0	22.0	48.5	46.6	48.4
May	92.0	31.0	61.3	94.0	32.0	62.1	61.8	62.1
June	92.5	43.5	64.1	92.0	44.0	65.9	67.0	67.2
July	94.5	49.5	72.6	93.0	50.0	72.7	73.3	74.2
August	97.0	45.5	70.8	97.0	45.0	71.1	73.9	73.2
September	92.0	35.0	62.1	89.0	32.0	61.5	63.7	63.3
October	75.0	25.5	48.5	74.0	25.0	48.6	54.2	60.2
November	71.0	20.0	45.2	70.0	18.0	44.2	47.5	48.5
December	57.5	-3.0	28.0	55.0	-7.0	27.3	38.3	29.9

Note. — The maximum and minimum air temperatures in above table are the highest and lowest temperatures in any one day of the month. The mean air temperature is the average of the maximum and minimum temperatures of the whole month. The water temperatures are the mean temperatures for the whole month.

TABLE XVI.

Rainfall in Inches on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July–Oct.
1863.....	4.10	4.38	3.57	11.34	2.66	1.98	14.12	5.61	3.39	4.56	8.54	5.05	69.30	27.68
1864.....	3.37	0.98	8.44	4.02	2.84	0.58	1.06	3.56	1.52	6.50	5.45	4.28	42.60	12.64
1865.....	4.99	4.45	5.48	2.18	8.25	0.91	3.10	3.36	1.66	6.99	4.78	3.31	49.46	15.11
1866.....	1.44	5.80	3.92	1.94	6.46	4.80	13.35	3.98	8.36	3.43	4.52	4.32	62.32	29.12
1867.....	2.76	5.40	5.65	2.43	6.46	2 95	5.36	12.36	1.08	7.27	2.63	1 90	56.25	26.07
1868.....	3.70	1.18	2.51	5.61	8.12	2.95	2.16	7.38	7.69	1.19	6.77	0.45	49.71	18.42
1869.....	3.71	7.07	7.52	2.57	7.59	3.68	2.63	2.34	8.49	9.50	3.26	5.98	64.34	22.96
1870.....	7.85	4.68	6.04	8.81	3.14	4.05	3.10	2.03	0.64	7.96	4.40	3.19	55.89	13.73
1871.....	1.31	2.30	5.02	2.29	5.66	5.96	2.20	3.56	1.46	5.38	7.01	3.24	45.39	12.60
1872.....	1.86	1.37	3.06	1.74	3.24	4.27	5.55	9.76	6.29	3.69	4.22	3.42	48.47	25.29
1873.....	4.24	2.43	3.98	2.69	3.24	0.38	4.08	7.17	2.62	6.11	4.54	3.95	45.43	19.98
1874.....	2.96	2.90	1.19	6.36	3.40	4.79	3.16	4.83	1.55	1.04	2.05	1.70	35.93	10.58
1875.....	2.42	3.15	3.74	3.23	3.56	6.24	3.57	5.53	3.43	4.85	4.83	0.94	45.49	17.38
1876.....	1.83	4.21	7.43	3.24	2.80	1.60	9.49	2.19	3.98	2 00	6.59	3.13	48.49	17.66
1877.....	3.19	0.53	7.79	3.24	3.73	2.64	2.77	3.35	0.46	8.14	6.94	1.02	43.80	14.72
1878.....	5.77	5.93	4.20	5.63	0.83	3.33	3.47	6.94	1.12	5.15	6.09	5.12	53.58	16.68
1879.....	2.00	3.05	3.90	4.69	1.20	4.14	3.38	6.43	1.74	0.90	2.98	3.60	38.01	12.45
1880.....	3.07	5.05	2.83	2.94	1.98	1.25	7.00	3.81	1.69	2.95	1.70	2.56	35.83	15.45

TABLE XVI.— *Concluded.*

Rainfall in Inches on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July-Oct.
1881...	5.56	4.43	4.79	1.71	3.18	4.83	2.78	1.13	2.13	2.87	3.85	3.83	41.09	8.91
1882.....	5.93	3.96	2.76	1.89	4.73	1.87	3.49	1.14	9.20	2.22	0.93	2.17	40.29	16.95
1883....	2.88	3.59	1.76	2.27	3.95	1.81	2.88	0.39	1.31	5.16	2.06	3.14	31.20	9.74
1884.....	4.39	6.04	4.50	3.80	2.92	3.88	4.42	4.49	0.90	2.59	2.33	5.31	45.57	12.40
1885.....	5.25	3.98	1.09	3.71	3.46	2.96	1.73	7.01	1.63	5.26	5.26	2.32	43.66	15.63
1886.....	6.53	6.86	3.46	2.00	2.97	1.21	3.30	3.75	3.20	3.16	4.76	5.77	46.97	13.41
1887.....	5.29	5.34	5.10	4.45	1.02	2.58	3.77	3.70	1.28	2.49	2.76	3.80	41.58	11.24
1888.....	4.13	3.55	5.60	2 51	4.63	2.07	1.67	6.32	8.81	4.95	7.03	5.66	56.93	21.75
1889.....	5.46	1.56	2.28	3.19	3.64	3.17	9.10	4.57	4.92	3.85	5.79	2.70	50.23	22.44
1890.....	2.34	3.21	7.35	2.51	5.31	1.78	2.31	3.34	6.47	10.11	1.24	5.26	51.23	22.23
1891.....	6.67	5.02	5.49	3.62	1.67	3.78	2.99	4.91	2.12	4.14	2.84	3.17	46.42	14.16
1892.....	4.78	2.80	4.12	0.78	5.46	3.23	3.47	3.79	2.87	1.42	5.14	1.18	39.04	11.55
1893.....	2.61	7.26	3.13	3.21	5.45	2.75	2.40	5.86	1.76	3.74	2.08	5.03	45.28	13.76
1894.....	3.95	3.89	1.16	3.27	3.70	1.61	3.61	2.57	2.27	5.14	3.53	4.38	39.08	13.59
1895	3.93	1.70	3.11	5.03	2.03	3.12	4.71	3.96	2.77	9.57	6.32	2.71	48.96	21.01
1896.....	2.43	6.70	5.20	1.60	2.27	3.04	2.22	2.43	8.21	3.53	3.00	2.15	42.78	16.39
Totals.....	132.70	133.75	147.17	120.50	131.55	100.19	144.40	153.55	117.02	157.81	146.22	115.74	1,600.60	572.78
Averages	3.90	3.93	4.33	3.54	3.87	2.95	4.25	4.52	3.44	4.64	4.30	3.40	47.08	16.85

TABLE XVII.

Rainfall collected in Inches on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July–Oct.
1863	1.93	3.11	3.71	4.42	1.44	0.67	2.97	1.51	0.98	1.32	2.65	2.17	26.88	6.78
1864	2.39	1.56	4.05	2.65	1.62	0.49	0.41	0.68	0.49	1.43	1.25	1.33	18.35	3.01
1865	2.15	1.74	4.66	2.70	4.70	0.34	0.46	0.47	0.45	0.70	1.00	1.13	20.50	2.08
1866	0.73	2.84	1.76	1.63	1.29	1.10	1.20	0.64	1.34	0.93	0.99	1.56	16.01	4.11
1867	1.10	5.24	3.50	2.87	2.20	0.65	0.59	2.10	0.31	1.02	1.10	1.12	21.80	4.02
1868	1.22	1.12	3.84	3.48	6.17	1.59	0.45	1.18	1.85	0.95	1.96	1.17	24.98	4.43
1869	1.82	1.84	3.31	2.49	2.20	1.07	0.74	0.58	1.10	2.37	1.30	3.17	21.99	4.79
1870	4.71	3.93	3.38	6.87	1.66	0.97	0.53	0.41	0.86	1.11	0.88	0.77	26.08	2.91
1871	1.03	2.28	2.53	1.58	2.00	0.87	0.43	0.85	0.39	0.69	1.30	1.21	15.16	2.36
1872	1.15	0.93	1.41	3.08	1.10	1.49	0.14	1.32	1.70	1.69	2.00	1.21	17.22	4.85
1873	3.09	1.57	3.89	6.09	2.66	0.45	0.62	1.40	0.78	2.04	1.86	2.68	27.13	4.84
1874	3.55	2.19	1.84	3.19	2.78	1.96	0.95	0.92	0.53	0.52	0.58	0.51	19.52	2.92
1875	0.13	1.92	2.66	3.15	1.39	1.48	0.25	0.62	0.60	1.19	1.96	1.22	17.57	2.66
1876	1.09	1.78	5.19	4.20	1.43	0.51	0.84	0.29	0.88	0.49	1.85	0.99	19.54	2.50
1877	1.20	1.37	6.81	3.24	2.04	0.92	0.65	0.67	0.46	1.16	2.69	1.96	23.17	2.94
1878	3.25	3.97	5.40	2.86	1.66	0.76	0.47	0.84	0.29	0.73	2.07	4.04	26.34	2.33
1879	1.29	2.32	3.30	4.48	1.40	0.77	0.33	0.95	0.61	0.60	0.72	1.04	17.81	2.49
1880	1.47	2.24	1.79	1.57	0.44	0.06	0.33	0.32	0.24	0.49	0.83	0.61	10.30	1.29

TABLE XVII.—*Concluded.*

Rainfall collected in Inches on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July–Oct.
1881.....	1.19	2.23	5.66	1.79	1.26	1.31	0.16	0.09	0.23	0.18	0.84	1.40	16.34	0.66
1882.....	1.84	3.00	3.76	0.93	1.55	0.62	0.06	0.07	0.97	0.84	0.58	0.92	15.05	1.94
1883	0.84	1.59	2.04	1.66	1.26	0.07	0.02	0.07	0.62	0.59	0.41	0.94	10.11	1.30
1884.....	1.84	2.86	4.67	4.00	1.39	0.67	0.26	0.61	0.13	0.34	0.62	1.82	19.21	1.34
1885.....	1.90	2.00	2.21	2.36	1.61	0.53	0.00	0.33	0.25	0.79	2.05	1.64	15.57	1.37
1886.....	2.28	7.93	3.51	2.52	1.09	0.18	0.25	0.14	0.30	0.42	1.20	2.10	21.92	1.11
1887.....	4.06	4.34	4.70	3.36	1.35	0.82	0.72	1.33	0.64	0.49	0 70	0.96	23.47	3.18
1888.....	1.13	2.77	4.76	3.45	2.37	0.53	0.47	0.94	2.31	2.57	4.21	5.46	30.97	6.29
1889.....	4.50	1.85	2.08	2.17	1.20	1.18	1.63	3.43	1.79	1.91	2.95	3.26	27.95	8.76
1890.....	1.92	2.04	5.87	2.23	1.85	1.41	0.33	0.46	1.40	3.40	1.49	2.11	24.51	5.59
1891.....	6.26	6.62	8.03	4.31	0.88	0.77	0.50	0.72	0.76	0.79	0.83	1.60	32.07	2.77
1892.....	3.18	1.64	3.12	0.90	2.03	0.49	0.33	0.56	0.60	0.57	1.09	0.84	15.35	2.06
1893.....	0.64	2.55	4.12	2.42	1.83	0.75	0.38	0.77	0.42	1.09	1.00	1.68	17.65	2.66
1894.....	1.27	1.69	2.55	2.15	0.91	0.45	0.38	0.41	0.46	0.66	0.92	1.14	12.99	1.91
1895.....	1.58	0.75	3.50	3.35	0.97	0.40	0.55	0.50	0.69	1.97	3.51	2.40	20.17	3.71
1896.....	1.72	3.69	5.52	2.01	0.32	0.71	0.37	0.47	1.03	1.28	1.39	1.30	20.14	3.15
Totals.....	69.45	90.50	129.04	100.16	60.35	26.94	18.77	26.56	26.46	37.32	50.78	57.46	693.82	109.11
Averages.....	2.04	2.66	3.79	2.95	1.77	0.79	0.55	0.78	0.78	1.10	1.49	1.69	20.41	3.21

TABLE XVIII.

Percentage of Rainfall collected on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly.	4 months. July-Oct.
1863	47.0	71.0	104.0	39.0	54.0	34.0	21.0	27.0	29.0	29.0	31.0	43.0	38.8	24.5
1864	71.0	159.0	48.0	66.0	57.0	84.0	39.0	19.0	32.0	22.0	23.0	31.0	43.0	23.8
1865	43.0	39.0	85.0	124.0	57.0	37.0	15.0	14.0	27.0	10.0	21.0	34.0	41.4	13.8
1866	51.0	49.0	45.0	84.0	20.0	23.0	9.0	16.0	16.0	27.0	22.0	36.0	25.7	14.1
1867	40.0	97.0	62.0	118.0	34.0	22.0	11.0	17.0	29.0	14.0	42.0	59.0	38.7	15.4
1868	33.0	95.0	153.0	62.0	76.0	54.0	21.0	16.0	24.0	80.0	29.0	261.0	50.2	24.0
1869	49.0	26.0	44.0	97.0	29.0	29.0	28.0	25.0	13.0	25.0	40.0	53.0	34.2	20.9
1870	60.0	84.0	56.0	78.0	53.0	24.0	17.0	20.0	134.0	14.0	20.0	24.0	46.7	21.2
1871	79.0	99.0	50.4	68.8	35.3	14.6	19.6	23.8	26.8	12.8	18.5	37.4	33.4	18.7
1872	61.8	67.8	46.0	177.3	33.8	34.8	2.6	13.5	27.0	45.7	47.4	35.3	35.5	19.2
1873	72.9	64.8	97.8	226.4	82.2	119.1	15.1	19.5	29.8	33.4	40.9	67.9	59.8	24.2
1874	120.0	75.5	154.7	50.2	81.7	40.8	30.0	19.1	34.3	50.3	28.4	29.9	54.3	27.6
1875	5.5	92.8	71.2	97.5	39.9	23.7	7.1	11.2	17.4	24.6	40.5	129.8	38.6	15.3
1876	59.3	42.4	69.9	129.7	50.9	31.6	8.9	13.3	22.2	24.3	28.1	31.5	40.3	14.2
1877	37.6	258.9	87.4	100.0	54.6	34.8	23.3	19.6	99.8	14.3	38.8	192.6	52.9	20.0
1878	56.3	66.9	128.6	50.7	200.0	23.2	13.5	12.0	25.8	14.3	34.0	78.8	49.2	14.0
1879	64.4	76.3	84.5	95.6	117.0	18.6	9.7	14.7	35.0	66.5	24.2	28.9	46.9	20.0
1880	47.9	55.3	63.3	53.3	22.2	4.5	4.7	6.1	14.3	16.6	48.9	23.8	28.7	8.3
1881	21.5	50.3	118.1	104.8	39.6	27.0	5.8	7.6	10.8	6.4	21.8	36.7	39.8	7.4

TABLE XVIII.—*Concluded.*

Percentage of rainfall Collected on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly.	4 months. July–Oct.
1882.....	31.0	75.9	133.0	49.3	32.8	33.1	1.7	6.2	10.5	37.9	62.4	42.3	37.4	12.1
1883.....	29.2	44.3	115.8	73.1	31.9	3.7	0.6	18.6	47.4	11.5	20.0	29.8	32.4	13.3
1884.....	41.8	47.4	103.9	105.1	47.5	17.3	5.0	13.6	14.9	13.1	26.7	34.2	42.2	10.8
1885.....	36.1	50.2	202.7	63.6	46.7	14.4	0.0	4.8	15.5	15.0	39.0	70.7	35.7	8.8
1886.....	36.6	107.3	101.9	154.3	43.0	35.5	11.1	7.8	10.7	13.4	21.7	29.7	49.7	8.3
1887.....	60.2	80.8	72.0	81.3	112.0	47.3	13.2	27.1	32.0	18.7	23.4	25.6	47.8	28.3
1888.....	27.5	78.0	85.0	137.3	51.2	25.8	28.1	14.9	26.2	51.9	59.9	96.4	54.4	28.9
1889.....	82.5	118.7	91.5	68.1	32.9	37.1	17.9	75.0	36.4	49.6	50.9	120.9	55.6	39.0
1890.....	82.0	63.4	79.9	88.9	34.9	79.1	14.2	13.9	21.6	33.7	120.0	40.2	47.9	25.1
1891.....	93.8	131.9	146.3	119.1	52.8	20.4	16.7	14.7	35.9	19.0	29.2	50.5	69.1	19.6
1892.....	66.6	58.5	75.7	115.5	37.1	15.3	9.5	14.7	21.1	40.2	21.2	71.1	39.3	17.8
1893.....	24.5	35.1	131.7	75.7	33.5	27.2	15.9	13.2	23.9	28.8	48.4	33.4	39.0	19.3
1894.....	32.3	43.5	219.7	65.8	24.6	27.9	10.4	16.1	20.0	12.8	26.1	26.1	33.3	14.1
1895.....	40.1	44.2	112.4	66.5	47.8	13.0	11.8	12.6	25.0	20.6	55.5	88.6	41.2	17.5
1896.....	70.9	55.0	106.2	125.8	27.5	23.5	16.9	19.4	12.5	36.4	46.5	60.6	47.1	21.3
Totals.....	1,775.3	2,604.2	3,346.6	3,211.7	1,793.4	1,100.3	475.2	587.0	1,000.8	932.8	1,250.4	2,053.7	1,470.2	630.8
Averages.....	52.2	76.6	98.4	94.5	52.7	32.4	14.0	17.3	29.4	27.4	36.8	60.4	43.2	18.5

TABLE XIX.

Rainfall in Inches on Sudbury-river Water-shed, 1875 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July-Oct.
1875	2.420	3.150	3.740	3.230	3.560	6.240	3.570	5.530	3.430	4.850	4.830	0.940	45.490	17.380
1876	1.830	4.210	7.430	4.197	2.763	2.040	9.134	1.720	4.614	2.241	5.764	3.620	49.563	17.709
1877	3.216	0.739	8.357	3.435	3.702	2.425	2.951	3.682	0.323	8.515	5.803	0.870	44.018	15.471
1878	5.632	5.973	4.689	5.790	0.956	3.884	2.971	6.937	1.291	6.417	7.024	6.367	57.931	17.616
1879	2.478	3.562	5.140	4.716	1.579	3.789	3.933	6.509	1.878	0.809	2.682	4.344	41.419	13.129
1880	3.566	3.980	3.315	3.105	1.836	2.138	6.273	4.008	1.603	3.740	1.785	2.828	38.177	15.624
1881	5.558	4.646	5.730	2.000	3.511	5.395	2.350	1.358	2.617	2.955	4.091	3.958	44.169	9.280
1882	5.951	4.546	2.649	1.824	5.066	1.664	1.769	1.667	8.741	2.074	1.147	2.296	39.394	14.251
1883	2.810	3.865	1.780	1.845	4.185	2.400	2.680	0.735	1.520	5.600	1.810	3.550	32.780	10.535
1884	5.085	6.545	4.720	4.405	3.470	3.445	3.665	4.650	0.855	2.480	2.645	5.170	47.135	11.650
1885	4.710	3.865	1.070	3.605	3.485	2.865	1.425	7.185	1.425	5.095	6.095	2.720	43.545	15.130
1886	6.365	6.280	3.610	2.224	2.995	1.465	3.265	4.100	2.905	3.235	4.645	4.975	46.065	13.505
1887	5.200	4.780	4.900	4.265	1.165	2.650	3.760	5.280	1.320	2.835	2.670	3.880	42.705	13.195
1888	4.150	3.685	6.020	2.425	4.825	2.535	1.405	6.225	8.585	4.990	7.224	5.395	57.465	21.205
1889	5.370	1.655	2.365	3.410	2.945	2.800	8.940	4.175	4.605	4.255	6.290	3.140	49.950	21.975
1890	2.530	3.505	7.735	2.645	5.210	2.030	2.460	3.865	6.000	10.510	1.200	5.310	53.000	22.835
1891	7.020	5.235	6.475	3.905	2.010	3.770	3.395	4.725	2.380	3.830	3.090	3.685	49.520	14.230
1892	5.850	3.140	4.060	0.830	5.585	2.760	4.230	4.440	2.840	1.170	5.800	1.125	41.830	12.680
1893	2.925	8.195	3.670	3 605	6.610	2.380	2.570	5.415	1.735	4.065	2.195	4.860	48.225	13.785
1894	4.090	3.910	1.435	3.415	4.235	1.155	3.255	2.030	2.635	5.345	3.425	4.810	39.740	13.265
1895	4.060	1.395	2.980	5.250	2.020	2.770	5.040	4.150	2.300	10.680	6.625	3.350	50.620	22.170
1896	2.390	7.180	5.235	1.570	2.575	3.220	2.510	2.395	7.720	3.765	3.020	2.125	43.705	16.390
Totals	93.206	94.041	97.105	71.697	74.288	63.820	81.551	90.781	71.322	99.456	89.861	79.318	1006.446	343.110
Averages	4.236	4.275	4.414	3.259	3.377	2.901	3.707	4.125	3.242	4.521	4.085	3.605	45.748	15.596

TABLE XX.

Rainfall collected in Inches on Sudbury-river Water-shed, 1875 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July-Oct.
1875.....	0.184	2.411	2.862	5.263	2.119	1.501	0.573	0.706	0.358	1.152	2.248	1.041	20.418	2.789
1876.....	1.147	2.282	7.911	5.683	2.031	0.383	0.326	0 723	0.318	0.417	1.878	0.809	23.908	1.764
1877.....	1.174	1.529	8.586	4.132	2.482	1.031	0 360	0.216	0.103	1.127	2.447	2.300	25.487	1.806
1878.....	3.228	3.972	6.256	2.807	2.487	0.873	0.229	0.848	0.277	0.921	2.922	5.667	30.487	2.275
1879.....	1.249	2.756	4.156	5.379	1.987	0.713	0.281	0.705	0.243	0.126	0.355	0.825	18.775	1.355
1880.....	2.000	2.982	2.451	2.017	0.917	0.303	0.315	0.212	0.138	0.181	0.354	0.312	12.182	0.846
1881.....	0.740	2.491	7.142	2.669	1.721	2.309	0.493	0.264	0.340	0.331	0.682	1.383	20.565	1.428
1882.....	2.213	3.872	5.064	1.497	2.304	0.913	0.154	0.099	0.529	0.534	0.362	0.51	18.102	1.316
1883.....	0.597	1.664	2.873	2.330	1.673	0.518	0.206	0.140	0.157	0.331	0.354	0.345	11.188	0.834
1884.....	1.775	4.742	6.752	4.925	1.838	0.719	0.399	0.458	0.076	0.148	0.302	1.650	23.784	1.081
1885.....	2.203	2 182	2.805	3.133	2.383	0.735	0.111	0.429	0.209	0.599	2.033	2.094	18.916	1.348
1886.....	2.606	7.734	3.673	3.361	1.285	0.350	0.206	0.168	0.203	0.260	1.161	1.819	22.825	0.887
1887.....	4.619	4.558	5.116	4.522	1.799	0.714	0.204	0.382	0.191	0.339	0.636	1.147	24.227	1.116
1888.....	1.878	3.255	5.775	4.566	2.912	0.728	0.209	0.677	1.994	3.566	4.761	5.428	35.749	6.446
1889.....	4.963	1.926	2.388	2.434	1.569	1.128	1.130	2.554	1.422	2.194	3.351	3.997	29.056	7.300
1890.....	2.237	2.463	6.498	3.236	2.437	0.980	0.191	0.235	0.790	4.053	2.097	1.776	26.993	5.269
1891.....	5.383	5.616	7.944	4.138	1.039	0.714	0.266	0.290	0.350	0.375	0.526	0.971	27.612	1.281
1892.....	3.335	1.574	3.488	1.504	2.245	0.739	0.382	0.500	0.396	0.224	1.204	0.865	16.456	1.502
1893.....	0.773	2.485	5.789	3.668	5.143	0.759	0.282	0.322	0.187	0.395	0.550	1.421	21.774	1.186
1894.....	1.236	1.596	3.992	2.832	1.498	0.722	0.287	0.373	0.258	0.668	1.442	1.277	16.182	1.586
1895.....	1.844	0.871	4.290	4.341	1.134	0.301	0.411	0.409	0.153	2.460	4.794	3.179	24.196	3.433
1896.....	1.933	4.466	6.841	2.579	0.641	0.689	0.170	0.102	0.669	1.055	1.137	1.171	21.453	1.996
Totals.....	47.317	67.427	112.660	77.016	43.644	17.823	7.185	10.812	9.361	21.456	35.596	40.038	490.335	48.814
Averages	2.151	3.065	5.121	3.501	1.984	0.810	0.326	0.491	0.425	0.975	1.618	1.820	22.288	2.219

TABLE XXI.

Percentage of Rainfall collected on Sudbury-river Water-shed, 1875 to 1896.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.	4 months, July-Oct.
1875.....	7.6	76.5	76.5	162.9	59.5	24.0	16.0	12.8	10.4	23.8	46.5	110.7	44.9	16.0
1876.....	62.7	54.2	106.5	135.4	73.5	18.8	3.6	42.0	6.9	18.6	32.6	22.3	48.2	10.1
1877.....	36.5	206.9	102.7	120.3	67.0	42.5	12.2	5.9	31.9	13.2	42.2	264.4	57.9	11.7
1878.....	57.3	66.5	133.4	48.5	260.2	27.2	7.7	12.2	21.5	14.3	41.6	89.0	52.6	12.9
1879.....	50.4	77.4	80.9	114.1	125.8	18.8	7.1	10.8	12.9	15.6	13.2	19.0	45.3	10.3
1880..... ...	56.0	74.9	73.9	65.0	50.0	14.2	5.0	5.3	8.6	4.8	19.9	11.0	31.9	5.4
1881.....	13.3	53.6	124.6	133.4	49.0	42.8	21.0	19.4	13.0	11.2	16.7	34.9	46.6	15.4
1882.....	37.2	85.2	191.2	82.1	45.5	54.9	8.7	5.9	6.0	25.7	31.5	24.5	45.9	9.2
1883.....	21.2	43.0	161.4	126.3	40.0	21.6	7.7	19.1	10.4	5.9	19.5	9.7	34.1	7.9
1884....	34.9	72.5	143.1	111.8	53.0	20.9	10.9	9.8	8.9	6.0	11.4	31.9	50.5	9.3
1885.....	46.8	56.4	262.1	86.9	68.4	25.7	7.8	6.0	14.7	11.8	33.3	77.0	43.4	8.9
1886.....	40.9	123.2	101.7	151.1	42.9	23.9	6.3	4.1	7.0	8.0	25.0	36.6	49.5	6.2
1887...	88.8	95.3	104.4	106.0	154.5	26.9	5.5	7.2	14.5	12.0	23.8	29.6	56.7	8.5
1888.....	45.3	88.3	95.9	188.3	60.3	28.7	14.9	10.9	23.2	71.4	65.9	100.6	62.2	30.4
1889.....	92.4	116.4	100.9	71.4	53.3	40.3	12.6	61.2	30.9	51.6	53.3	127.3	38.2	33.2
1890.	88.4	70.3	84.0	122.3	46.8	48.3	7.8	6.1	13.2	38.6	174.7	33.5	50.9	23.1
1891.....	76.7	107.3	122.7	106.0	51.7	18.9	7.8	6.1	14.7	9.8	17.0	26.3	55.8	8.9
1892...	57.0	50.1	85.9	181.1	40.2	26.8	9.0	11.3	13.9	19.2	20.7	76.9	39.3	11.8
1893.....	26.4	30.3	157.7	101.7	77.8	31.9	11.0	5.9	10.8	9.7	25.1	29.2	45.2	8.6
1894.....	30.2	40.8	278.2	82.9	35.4	62.6	8.8	18.4	9.8	12.5	42.1	26.5	40.7	12.0
1895.....	45.4	62.5	144.2	82.7	56.1	10.8	8.2	9.9	6.7	23.0	72.4	94.9	47.8	15.5
1896.....	80.9	62.2	130.7	164.3	24.9	21.4	6.8	4.3	8.7	28.0	37.7	55.1	49.1	11.9
Totals....	1096.3	1713.8	2862.6	2544.5	1535.8	647.2	206.4	294.6	298.6	434.7	866.1	1330.9	1056.7	287.2
Averages	49.8	77.9	131.1	115.7	69.8	29.4	9.4	13.4	13.6	19.8	39.4	60.5	48.0	13.1

TABLE XXII.

Rainfall in Inches on Mystic Water-shed, 1878 to 1896.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July-Oct.
1878.....	5.67	5.74	3.93	5.73	0.67	2.62	3.52	7.51	3.19	4.95	5.69	4.845	54.065	19.17
1879.....	1.82	2.73	3.52	4.65	1.86	3.98	2.39	5.48	1.60	0.77	2.76	3.74	35.30	10.24
1880.....	2.62	4.23	2.49	2.18	2.02	1.49	7.23	3.64	1.42	2.70	1.90	2.50	34.42	14.99
1881.....	5.82	3.63	6.69	1.54	2.98	6.84	2.60	0.67	2.17	2.16	3.52	3.29	41.91	7.60
1882.....	5.545	4.68	2.49	2.11	4.58	2.09	2.34	1.065	8.35	1.94	1.745	2.23	39.165	13.695
1883.....	2.67	3.065	2.22	2.47	3.585	1.635	2.785	0.87	1.495	5.45	1.98	2.995	31.22	10.60
1884.....	4.745	6.085	4.255	3.18	2.95	4.635	3.72	4.855	0.70	2.70	2.005	4.56	44.39	11.975
1885.....	4.83	3.40	1.175	3.445	3.945	4.41	2.04	5.90	1.425	5.52	6.31	2.10	44.50	14.885
1886.....	6.315	7.175	3.84	2.10	2.945	1.54	3.71	3.24	2.955	2.85	4.065	4.825	45.560	12.755
1887.....	5.245	4.47	5.00	4.605	1.69	2.695	6.585	4.965	1.50	3.04	3.05	3.575	46.42	16.090
1888.....	4.05	3.28	5.185	2.84	5.095	2.20	2.23	6.23	8.56	4.955	6.85	5.27	56.745	21.975
1889.....	5.505	1.86	2.285	3.61	4.64	3.315	8.455	3.92	4.705	3.59	5.65	2.86	50.395	20.67
1890.....	2.725	3.38	6.68	2.405	6.30	3.38	2.265	3.64	3.70	8.84	1.385	4.67	49.37	18.445
1891.....	6.245	5.075	6.07	3.15	2.46	4.43	3.18	3.88	2.16	4.735	2.605	3.41	47.40	13.955
1892.....	4.515	3.015	4.005	0.815	5.585	4.15	2.575	4.82	2.005	1.835	4.645	1.15	39.115	11.235
1893.....	2.26	7.50	2.55	3.37	6.26	2.10	2.04	5.41	2.01	4.10	2.25	4.35	44.20	13.56
1894.....	3.93	3.31	1.09	3.48	5.18	0.72	3.45	2.52	2.52	5.58	3.49	3.97	39.24	14.07
1895.....	3.535	0.655	3.00	4.185	3.150	3.630	4.345	5.435	2.040	10.195	7.260	2.300	48.73	22.015
1896.....	2.355	5.085	4.550	1.775	2.010	2.345	2.420	2.610	7.885	3.220	3.320	2.330	39.90	16.135
Totals.....	80.400	78.365	71.025	57.640	67.905	58.205	67.880	76.660	60.390	79.130	69.480	64.970	832.045	284.060
Averages.....	42.316	41.245	37.38	30.337	35.74	30.634	35.726	40.347	31.784	41.648	36.568	34.195	43.792	14.950

TABLE XXIII.

Rainfall Collected in Inches on Mystic Water-shed, 1878 to 1896.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.	4 months, July-Oct.
1878.....	3.55	3.97	4.91	2.21	2.16	0.78	0.48	1.11	0.56	0.71	1.75	3.63	25.82	2.86
1879.....	1.21	2.33	3.31	3.97	1.95	0.97	0.54	0.70	0.48	0.34	0.45	0.69	16.94	2.06
1880.....	1.70	2.54	1.95	1.50	0.96	0.51	0.67	0.54	0.45	0.36	0.44	0.59	12.21	2.02
1881.....	0.82	2.14	6.79	2.17	1.51	2.05	0.87	0.35	0.31	0.29	0.50	0.87	18.67	1.82
1882.....	1.37	3.03	4.19	1.16	1.85	0.81	0.35	0.22	0.53	0.58	0.39	0.57	15.05	1.68
1883.....	0.70	1.43	1.88	1.63	1.20	0.52	0.30	0.22	0.18	0.39	0.42	0.44	9.31	1.09
1884.....	1.49	3.89	5.42	3.85	1.48	0.85	0.58	0.60	0.23	0.27	0.35	1.17	20.18	1.68
1885.....	1.79	1.81	2.05	2.03	2.18	0.86	0.47	0.54	0.34	0.68	2.41	2.39	17.55	2.03
1886.....	2.31	7.70	3.91	3.24	1.27	0.55	0.41	0.25	0.32	0.38	0.88	1.43	22.65	1.36
1887.....	3.16	3.61	3.60	3.75	1.89	1.27	0.87	1.35	0.48	0.57	0.71	0.91	22.17	3.27
1888.....	1.43	3.32	4.28	3.27	2.88	0.84	0.39	0.54	1.31	2.74	5.04	5.08	31.12	4.98
1889.....	4.51	1.83	1.60	2.27	2.18	1.89	1.33	2.05	1.06	1.21	2.49	3.06	25.48	5.65
1890.....	2.07	2.23	5.37	2.93	3.00	1.92	0.43	0.46	0.58	2.61	1.95	2.49	26.04	4.08
1891.....	6.29	5.97	7.21	3.43	1.40	1.01	0.42	0.44	0.42	0.58	0.56	0.87	28.60	1.86
1892.....	2.49	1.76	3.03	1.33	2.10	1.17	0.66	0.49	0.56	0.45	1.07	0.87	15.98	2.16
1893.....	0.75	2.14	4.52	2.72	4.42	1.04	0.47	0.69	0.41	0.55	0.71	1.27	19.69	2.12
1894.....	1.37	1.87	3.05	2.27	1.31	0.91	0.49	0.38	0.36	0.58	0.91	0.90	14.40	1.81
1895.....	1.55	0.87	3.16	2.95	1.14	0.54	0.60	0.80	0.36	1.46	2.37	2.12	17.91	3.22
1896.....	1.85	3.40	4.50	3.26	0.77	0.75	0.39	0.34	1.06	0.89	1.11	1.24	19.55	2.68
Totals....	40.41	55.84	74.73	49.84	35.65	19.24	10.72	12.07	10.00	15.64	24.50	30.59	379.32	58.43
Averages..	2.13	2.94	3.93	2.63	1.88	1.01	0.56	0.63	0.53	0.82	1.29	1.61	19.66	3.55

TABLE XXIV.

Percentage of Rainfall collected at Mystic Water-shed, 1878 to 1896.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.	4 months. July–Oct.
1878.....	62.6	69.2	125.0	38.6	322.9	29.6	13.5	14.8	17.7	14.3	30.8	74.9	47.8	14.9
1879.....	66.6	85.4	93.9	85.3	104.9	24.5	22.6	12.8	29.7	44.2	16.2	18.6	48.0	20.1
1880.....	64.9	60.1	78.4	68.8	47.3	34.3	9.2	14.7	31.7	13.5	22.9	23.8	35.5	13.5
1881.....	14.2	58.9	101.5	141.1	50.7	29.9	33.3	51.9	14.1	13.6	14.3	26.3	44.5	23.9
1882.....	24.8	64.8	168.4	55.0	40.4	38.6	14.9	20.8	6.3	30.0	22.2	25.5	38.4	12.3
1883.....	26.1	46.7	84.8	65.9	33.5	31.8	10.8	25.7	12.1	7.2	21.1	14.7	29.8	10.3
1884.....	31.5	63.9	127.3	121.2	50.2	18.3	15.5	12.4	33.5	9.9	17.4	25.6	45.5	14.0
1885.....	37.1	53.3	174.5	58.8	55.3	19.6	22.8	9.2	23.7	12.2	38.2	113.6	39.4	13.6
1886.....	36.6	107.3	101.9	154.3	43.0	35.5	11.1	7.8	10.7	13.4	21.7	29.7	49.7	10.7
1887.....	60.2	80.8	72.0	81.3	112.0	47.3	13.2	27.1	32.0	18.7	23.4	25.6	47.8	20.3
1888.....	35.2	101.3	82.5	115.2	56.6	38.1	17.5	8.8	15.3	55.3	73.6	96.4	54.8	22.7
1889.....	81.8	98.2	70.2	63.0	46.9	57.0	15.8	22.2	22.5	33.7	44.1	107.0	50.6	27.3
1890.....	75.6	66.0	80.4	121.8	47.6	56.9	19.0	12.7	15.6	29.5	141.2	53.5	52.8	22.1
1891.....	100.7	117.6	118.7	109.0	57.0	22.8	13.3	11.3	19.3	12.1	21.7	25.6	60.3	13.3
1892.....	55.0	58.5	75.7	163.6	37.5	28.3	25.7	10.2	27.7	24.3	23.1	75.2	40.9	19.2
1893.....	33.3	28.6	177.3	80.7	70.6	49.5	23.2	12.6	20.5	13.4	31.5	29.1	44.5	15.6
1894.....	34.8	56.5	280.1	65.4	25.3	125.8	14.2	15.1	14.3	10.5	26.0	22.7	36.7	12.9
1895.....	43.7	132.2	105.2	70.6	36.0	15.0	13.8	14.7	17.6	14.4	37.8	92.2	36.8	15.1
1896.....	78.7	66.8	98.9	183.5	38.5	31.9	16.2	12.9	13.5	27.5	33.4	53.1	49.0	17.5
Totals.....	963.4	1416.1	2216.7	1843.1	1276.2	734.7	325.6	347.7	377.9	397.7	660.6	933.1	852.8	319.3
Averages,	50.71	74.53	116.67	97.01	67.17	38.67	17.14	18.30	19.89	20.93	34.77	49.11	44.88	16.81

TABLE XXV.

Yield of Sudbury-river Water-shed, 1875–1896. Area of water-shed used includes water surfaces.

YEAR.	Rainfall.	Daily Average Yield for Year.	Yield per Square Mile per Day.	Rainfall. July–Oct.	Daily Average Yield. July–Oct.	Yield per Square Mile per Day.	Minimum Monthly Yield.				Minimum Yield in any week.		
							MONTH.	Rainfall.	Daily Average Yield for Month.	Yield per Square Mile per Day.	WEEK.	Daily Average Yield for Week.	Yield per Square Mile per Day.
	Inches.	Gallons.	Gallons.	Inches.	Gallons.	Gallons.		Inches.	Gallons.	Gallons.		Gallons.	Gallons.
1875.....	45.490	75,599,200	972,200	17.380	30,650,400	394,100	January.....	2.420	8,000,000	102,900			
1876.....	49.563	88,278,400	1,135,200	17.709	19,603,300	252,100	July.....	9.134	14,229,000	183,000	.....	4,000,000	51,400
1877.....	44.018	94,369,200	1,213,500	15.471	19,832,100	255,000	September ...	0.323	4,633,300	59,600	.....	1,800,000	23,100
1878.....	57.931	112,882,200	1,451,600	17.616	25,001,600	321,500	July.....	2.971	9,983,900	128,400	.....	5,300,000	68,200
1879.....	41.419	69,942,200	894,000	13.129	14,974,000	191,400	October.....	0.809	5,532,300	70,700			
1880.....	38.177	45,250,300	578,400	15.624	9,356,100	119,600	September ...	1.603	6,280,000	80,300			
1881.....	44.169	73,633,900	979,200	9.280	15,178,900	201,800	August	1.358	11,135,500	148,100			
1882.....	39.394	64,812,300	861,900	14.251	13,977,200	185,900	August.....	1.667	4,158,100	55,300	Aug. 20–26	2,604,000	34,600
1883	32.780	40,056,200	532,700	10.535	8,870,700	118,000	August.....	0.735	5,906,500	78,500			
1884.....	47.135	84,929,200	1,129,400	11.650	11,487,000	152,800	September ...	0.855	3,303,300	43,900	Sept. 14–20	51,300	700
1885.....	43.545	67,721,600	900,600	15.130	14,313,000	190,300	July..... ...	1.428	4,667,700	62,100			
1886.....	46.065	81,730,700	1,086,800	13.505	8,891,900	118,200	August.....	4.100	7,077,400	94,100			
1887.....	42.705	86,749,300	1,153,600	13.195	11,874,800	157,900	September ...	1.320	8,346,700	111,000	Sept. 18–24	6,162,900	82,000
1888.....	57.465	127,642,900	1,697,400	21.205	68,478,000	910,600	July.....	1.405	8,825,800	117,400			

TABLE XXV.—*Concluded.*

Yield of Sudbury-river Water-shed, 1875–1896. Area of Water-shed used includes water surfaces.

Year.	Rainfall.	Daily Average Yield for Year.	Yield per Square Mile per Day.	Rainfall. July–Oct.	Daily Average Yield. July–Oct.	Yield per Square Mile per Day.	Minimum Monthly Yield.				Minimum Yield in any week.		
							Month.	Rainfall.	Daily Average Yield for Month.	Yield per Square Mile per Day.	Week.	Daily Average Yield for Week.	Yield per Square Mile per Day.
	Inches.	Gallons.	Gallons.	Inches.	Gallons.	Gallons.		Inches.	Gallons.	Gallons.		Gallons.	Gallons.
1889.....	49.950	104,030,100	1,383,400	21.975	77,563,400	1,031,400	July.....	8.940	47,645,200	633,600			
1890.....	53.000	96,650,400	1,285,200	22.835	55,975,600	744,400	July.....	2.460	8,064,500	107,200	July 13–19	3,446,800	45,800
1891.....	49.520	98,865,500	1,314,700	14.330	13,608,900	181,000	July.....	3.395	11,212,900	149,100			
1892	41.830	58,753,000	781,300	12.680	15,957,700	212,200	October	1.170	9,461,300	125,800			
1893.....	48.225	77,963,300	1,036,700	13.785	12,602,400	167,600	September ...	1.735	8,126,700	108,100			
1894.....	39.740	57,937,800	770,400	13.265	16,856,900	224,200	September ...	2.635	11,243,300	149,500			
1895.....	50.620	86,632,900	1,152,000	22.170	36,477,200	485,100	September ...	2.300	6,673,300	88,700			
1896.....	43.705	76,607,100	1,018,700	16.390	21,214,600	282,100	August.....	2.395	4,312,900	57,400			
Averages..	45.748	80,365,400	1,068,700	15.596	23,761,200	313,500							

SUMMARY OF STATISTICS.

REPORT FOR 1896.

Boston Water Works, Suffolk County, Massachusetts, supplies also the cities of Somerville, Chelsea, and Everett.

Population by census of 1895 : —	
Boston	496,920
Chelsea	31,264
Somerville	52,200
Everett	18,573
Total	598,957

Date of Construction : —	
Cochituate Works	1848
Mystic	1864

By whom owned. — City of Boston.

Sources of supply. — Lake Cochituate, Sudbury river, and Mystic lake.

Mode of supply. — Sixty-five per cent from gravity works.
Thirty-five " " pumping "

PUMPING.

	COCHITUATE.	MYSTIC.
Builder of pumping machinery	Holly Mfg. Co. and Quintard Iron Works.	H. R. Worthington and G. F. Blake Mfg. Co.
Description of coal used : —		
a Kind	Bituminous.	Bituminous.
c Size	Broken.	Broken.
e Price per gross ton, in bins	$3 90, 3 94, 4 15	$3 55, 3 63 3 66, 3 81
f Per cent of ash	10.8	11.6
Coal consumed for year, in lbs.	5,143,055	8,699,970
Total pumpage for year, in gallons	5,182,810,750	4,374,612,900
Gallons pumped per lb. of coal.	1,007.7	502.9
Cost of pumping figured on pumping-station expenses, viz. :	$29,750 67	$34,445 37
Cost per million gallons raised to reservoir	$5 74	$7 88

CONSUMPTION.

	COCHITUATE.	MYSTIC.
Estimated population	481,700	135,400
Estimated number of consumers,	478,200	134,200
Total consumption, gallons	20,606,590,000	4,374,612,900
Passed through meters	4,804,020,000	784,800,000
Percentage metered	23.3	17.9
Average daily consumption gallons	56,288,200	11,951,100
Gallons per day, each inhabitant	116.9	88.3
Gallons per day, each consumer,	117.7	89.1

DISTRIBUTION.

Mains.

	COCHITUATE.	MYSTIC.
Kind of pipe used	Cast-Iron	Cast-Iron, Wrought-Iron, and Cement.
Sizes	48 in. to 4 in.	36 in. to 3 in.
Extended, miles	23.9	5.4
Total now in use	619.9	184.0
Distribution-pipes less than 4 in., length, miles	2.3	4.0
Hydrants added	253	96
Hydrants now in use	6,711	1,639
Stop-gates added	423	106
Stop-gates now in use	7,087	2,391

Services.

Kind of pipe used	Lead,	Lead and Wrought-Iron.
Sizes	$\frac{5}{8}$ in. to 6 in.	$\frac{1}{2}$ in. to 4 in.
Extended, feet	59,325	18,840
Service-taps added	2,441	822
Total now in use	73,320	24,942
Meters now in use	4,358	469
Motors and elevators in use	534	21

C.

IMPROVED SEWERAGE.

The work of extending the Improved Sewerage System has been continued as fast as the limited appropriation would admit, and the following is a brief review of the work done during the past year: —

The condition of the appropriation on Feb. 1, 1897, was as follows: —

Net appropriation	$6,375,404 96
Total expenditures	6,375,404 96

The following is a report of the work done: —

Neponset Intercepting Sewers.

During the past year the intercepting sewers in Neponset have been completed and are now in operation. The system connects with the Dorchester intercepting sewer in Chickatawbut street at Narragansett street, from this point the sewers extend as follows: an 18-inch pipe, reinforced by concrete in Chickatawbut street and Neponset avenue to Walnut street; a 15-inch pipe, also reinforced in part by concrete, in Walnut street to Woods street; a 12-inch pipe in Franklin, Fulton, and Ericcson streets to High street; an 8-inch pipe in Ericcson street to Walnut street, connecting with the sewer in the latter street, about 433 feet of which it was necessary to relay at a higher grade. The sewers built in Franklin, Fulton, and Ericsson streets are intended to serve as common sewers, and slants have been built in them for that purpose. In Neponset avenue an 8-inch pipe sewer was laid on each side of the street; on the east side, between Walnut and Taylor streets and on the west side from Walnut to a point 20 feet beyond the track of the N. Y., N. H. & H. Railroad. The length of sewers laid in the system are as follows: —

1,115	linear	feet,	18-inch	pipe.	
1,033	"	"	15	"	"
2,069	"	"	12	"	"
2,113	"	"	8	"	"
6,330					

Of this total 420 linear feet of 18-inch pipe was laid in 1895. The sewage from the common sewers is intercepted at three points, viz.: On Neponset avenue near Walnut street, on Walnut street at Wood street and on Ericsson street at High street; at each of these points a sump man-hole was built, with an overflow into the common sewer providing an ample outlet for storm water to the Neponset river; tide-gates, with suitable man-holes, were constructed on the common sewers where they serve as overflows.

MT. VERNON STREET OVERFLOW.

After the completion of work at Neponset the improved sewerage force was engaged in building the Mt. Vernon street overflow; this overflow is from the Dorchester Intercepting Sewer, just before its junction with the main intercepting sewer in Mt. Vernon street; crossing over the main sewer it extends almost due north, about 500 linear feet to the edge of the marsh; it consists of 491 linear feet of wooden flume, 9 feet 8 inches, by 5 feet 2 inches; 24 linear feet of brick chamber containing two pairs of wooden tide-gates, each 4 feet 6 inches, by 4 feet 10½ inches; and, connecting with the Dorchester Intercepting Sewer, 56 linear feet of 7 feet by 7 feet brick sewer, horseshoe shaped. This overflow is to relieve the lower portion of the Dorchester Intercepting Sewer in time of storm; it will not begin to operate until the intercepting sewer is flowing under a head of 0.86 feet; under these conditions the overflow will prove unobjectionable. In December, 1896, the improved sewerage force which had been steadily employed since May, 1890, was disbanded, and the men transferred to different departments of the city.

D.

[FROM THE CITY ENGINEER'S REPORT TO THE BOARD OF PARK COMMISSIONERS.]

COMMONWEALTH AVENUE.

Underground conduits for electric wires have been built by the Edison Electric Illuminating Company between Massachusetts avenue and Beacon street, and also on Charlesgate East and Charlesgate West, between Commonwealth avenue and Beacon street.

THE FENS.

The only work of construction done here during the year was the re-grading and re-surfacing the grounds and walks around the John Boyle O'Reilly monument. The area immediately around the monument has been covered with an artificial stone walk.

Two small temporary boat-landings were built, one nearly opposite Westland entrance and one at Brookline avenue.

RIVERWAY.

The yard at the Administration Building has been inclosed by a wall on the side towards the park and by a fence on the line of the railroad. The walks in the vicinity of the building have been surfaced and the plantations graded. The building was opened for the use of the public early in the season.

On Audubon road, between the railroad and Beacon street, the Street Department has built sewers on each side of the road, and the gas and water-pipes have been laid. The surfacing of the road is now in progress.

A temporary boat-landing was built near the gate-house at Brookline avenue.

LEVERETT PARK.

Three hundred and forty-four linear feet of 8-inch and 958 linear feet of 18-inch drains have been built from near the junction of Bynner street with the Parkway to Leverett pond. Catch-basins at this junction were built by the owners of the abutting land.

JAMAICA PARK.

A 6-inch sewer has been built from the Pine Bank Refectory to the sewer in Jamaicaway, near Perkins street, a distance of 1,050 feet.

On December 14 a contract was made with F. A. Snow for grading the drive, walks and slopes on the westerly side of the park between Perkins street and Jamaicaway. This work is now in progress.

The water-pipe from the pumping-station is nearly all laid, and the boilers and pumps should be repaired so that the plant can be used.

Arborway.

The drive on the traffic road has been surfaced for a distance of 1,350 feet westerly from South street.

On December 1 a contract was made with Thomas F. Broderick for building a wall on the line between the Arborway and the Arboretum. The work is not yet completed.

The bridge over the Parkway on the line of the New York, New Haven & Hartford Railroad, is nearly finished. This is a masonry structure of five arches, and makes an angle with the railroad of 63 degrees 3 seconds. The width of the bridge at right angles to the railroad is 69 feet. The southerly arch is over Morton street, and the northerly arch is over the traffic road on the northerly side of the Parkway. Each of these arches has a span of 41 feet 2 inches. The central arch has a span of 45 feet 2 inches, and is over the Parkway drive. On each side of the central arch there is an arch of 23 feet 2 inches span, the northerly one being over the bridle path and the southerly one over the promenade. The foundations rest upon beds of concrete, varying in thickness according to the character of the ground; all other masonry is of granite. The soffits of the arches and the parapets are fine pointed; all other exposed surfaces are quarry faced. The bridge is surmounted by a parapet 6 feet high on each side of the railroad.

The bridge was built by the New York, New Haven & Hartford Railroad Company, after plans made by Messrs. Shepley, Rutan & Coolidge, architects.

The drive between Washington street and Forest Hills street was opened to travel on August 2.

Arnold Arboretum.

A complete crusher plant has been established at the quarry on Bussey street, and the work of crushing stone for road construction and repair is now going on.

On October 5 a contract was made with James Doonan for grading the road on the northerly side of Peters' Hill, between the corner of Bussey and Walter streets and the corner of Bussey and South streets. This work will be completed early in the coming season.

West Roxbury Parkway.

A topographical survey of the portion of the Parkway between the Arboretum and Weld street has been made during the year.

Franklin Park.

The new drive at Forest Hills entrance was finished and opened to travel on August 2. At the same time Ellicott street, the last of the old highways in the park, was closed. The walk through this entrance has been finished, and the gravel has been deposited on the ride, but some work remains to be done to complete the latter.

At the Refectory the service drive from Blue Hill avenue to the service yard of the building has been built. A deep excavation for the drive and walls six feet high on each side of it were necessary. Steps on the path and walls on each side of the path, leading from Blue Hill avenue to the Refectory, have been built. The wall on the line of the road from Glen lane to the Refectory has been completed; also a wall on the southerly side of Glen lane from the Refectory drive to Blue Hill avenue.

The road to the Refectory and the court in front of the building have been surfaced, and the Pergola terrace has been covered with a temporary plank floor.

A drain was laid from the building to Blue Hill avenue, but, as at the time the sewer had not been built in that part of the avenue, a temporary drain was built from the end of the drain to the sewer at Wales street. The sewer has since been built in the avenue, and the park drain permanently connected with it. Another drain has been built from the carriage shed to the sewer in Blue Hill avenue. A 6-inch water pipe was laid from Blue Hill avenue to the Refectory.

The grading of the grounds in this vicinity has been nearly finished. The Refectory was opened on July 4.

Franklin Field.

No construction work has been done during the year except to repair some of the turf which had become winter-killed.

The Street Department has built a sewer on the southerly and easterly sides of the Field between the drainage ditch and the boundary line from Lyons street to Talbot avenue.

Dorchesterway.

The Street Department has completed the sewers on both sides of the Parkway, between Pond street and Dorchester avenue. The Water Department is now laying its pipes in this same section.

Work was resumed in August on the surfacing of the driveway. The gutters have been paved, the catch-basins built, the Telford foundation laid, and most of it covered with crushed stone on the section between Pond street and Dorchester avenue. A large amount of rock has been excavated between Dorchester avenue and Buttonwood street.

The Strandway.

Plans and specifications were prepared, and on June 4 a contract was made with Jones & Meehan for building the sea wall and grading that portion of the Strandway between O street and Marine Park, for the sum of $117,000. This work is now being done.

On October 19 a contract was made with Hugh Farrell for filling and grading that portion of the Strandway between H and O streets. This work will require about 160,000 cubic yards of filling which is to be furnished for 47 cents per cubic yard. Work was begun early in November, and is now in progress.

Plans have been prepared for the extension of the storm overflow sewers at I and N streets.

On December 1 a contract was made with James Dolan for removing the surplus loam from the site of the proposed playground on M, First and Second streets, and piling the same on the Strandway for future use there. The work is nearly finished.

Marine Park.

The new head-house was opened to the public on June 17, and the pier, which had been kept closed since the preceding winter on account of the work on the head-house, was opened on June 19.

As stated in the last annual report some of the columns supporting the iron pier had been broken by the pressure of the filling forming the beach. Measurements taken at frequent intervals having shown that the movement of the columns had practically ceased it was decided to repair them. This was done in the following manner: Two rows of four-spruce piles each were driven, one on each side of the column, on lines parallel to the direction of the pier and as near the columns as was practicable. The pile-driver was placed on the floor of the pier. Each row was capped with a 12-inch hard pine timber. Other piles were driven, and the pier was temporarily supported on them by blocking and by clamps around the column. The column then having been cut off at the proper grade, and about 1½ feet of the part below the cut broken away it was swung into a vertical position by jack screws. Two courses of 6-inch hard pine timber, laid close, were then placed on the caps and spiked to them, and the column lowered on to a bed of cement on the platform. Three columns were treated in this manner. The grades of the platforms vary according to the grade of the ground, but they are such that the timber can all be covered by the filling, and so no evidence of the injury be seen. The columns are 4½ feet in diameter, of cast iron, 1¼ inches thick, and filled solid with concrete. The tops of the columns are at grade 20, and they were sunk to a depth of from 60 to 64 feet, the lower 10 feet being in stiff clay, above which there was about 28 feet of mud. The weight to be raised in moving the columns was about 40 tons. Measurements taken since the work was done show no movement.

The old Refectory building has been removed, and the site graded and loamed.

The house occupied by the sergeant in charge of Fort Independence was thoroughly repaired during the spring.

Public Park, North End.

The work under the contract with Trumbull & Ryan, dated Nov. 4, 1895, was finished on November 2, at a cost of $43,055.26. This work consisted of the grading of the grounds north of Commercial street, the building of catch-basins and drains, the building of a wall on the line of Commercial street, and the building of all sea walls for the approaches to the proposed promenade piers, with the exception of the wall on the westerly dock, which was omitted on account of the insufficiency of the appropriation at the time.

On January 18, of this year, a contract was made with William L. Miller for building the wall on the westerly dock. This work has been begun.

Plans and specifications have been prepared for building the promenade and bath-house piers.

On September 16 a contract was made with Perkins & White for doing all the work, except planting, required to complete the section of this park between Charter and Commercial streets. This work is to be finished on or before June 1 of this year.

Wood Island Park.

Fourteen electric arc lamps have been set up on the gymnasium ground, and six on the large field. Three thousand four hundred and fifty-seven linear feet of underground conduit, carrying 5,801½ linear feet of cable to these lamps, have been built. The work was done by the Boston Electric Light Company.

A portion of the large field was covered with loam to provide for two baseball diamonds.

Agricultural tile drains have been laid in a portion of the gymnasium ground for the better draining of the same.

Charlestown Heights.

The only work of construction done here during the year was the building of a retaining wall on the line of St. Martin street, which was done under a contract with McHale & Heisler, dated Sept. 8, 1896. The work was completed late in the season at a cost of $4,640. Some grading remains to be done back of this wall, and iron railings are required on a part of it, and on the walls on either side of the shelter building; this will complete the construction of that portion of this park south of Medford street.

CHARLESTOWN PLAYGROUND.

The work of filling has gone on as heretofore at no expense to the department, except for the levelling of the material. About nine acres out of a total of fourteen acres have been filled nearly to grade.

CHARLESBANK.

The face of the sea wall was repointed early in the spring, and the usual repairs made in the gymnasium.

PLAYGROUNDS.

Surveys have been made of land for Playgrounds on Neponset avenue, Dorchester; on Bellevue and La Grange streets, West Roxbury; and of the city's lot on First, M and Second streets, South Boston.

The appended table shows the principal items of work completed to date.

Principal items of work completed on the several Parks to January 31, 1897.

	Main Park System.							Marine Park System.									
	Fens.	Riverway.	Leverett Park.	Jamaica Park.	Arborway.	Arnold Arboretum	Franklin Park	Dorchester way	Marine Park.	Castle Island.	Charlesbank.	Wood Island Park.	Charlestown Heights.	Franklin Field.	Public Park, North End.	Totals.
Driveways completed	87,690 sq. yds.	26,667 sq. yds.	23,760 sq. yds.	13,344 sq. yds.	28,670 sq. yds.	30,388 sq. yds.	120,864 sq. yds.	4,620 sq. yds.	17,685 sq. yds.							353,528 sq. yds.
	4 miles.	1.3 miles.	1.2 miles.	0.7 mile.	1.6 miles.	2.1 miles.	8.6 miles.	0.2 mile.	0.5 mile.							19.6 miles.
Walks completed	30,600 sq. yds.	13,089 sq. yds.	17,627 sq. yds.	9,734 sq. yds.	1,166 sq. yds.	16,138 sq. yds.	74,256 sq. yds.	1,883 sq. yds.	2,694 sq. yds.		14,432 sq. yds.		4,641 sq. yds.			185,660 sq. yds.
	3.4 miles.	1.5 miles.	2.4 miles.	1 mile.	0.1 mile.	4.2 miles.	10.75 miles.	0.3 mile.	0.3 mile.		1.5 miles.		0.4 mile			25.85 miles.
Rule completed	14,600 sq. yds.	17,800 sq. yds.	12,000 sq. yds.	9,861 sq. yds.	17,920 sq. yds.		14,800 sq. yds.									86,081 sq. yds.
	1.1 miles.	1.2 miles.	0.9 mile.	0.7 mile.	1.2 miles.		1.05 miles.									6.15 miles.
Gutters paved	10,900 sq. yds.	6,587 sq. yds.	5,335 sq. yds.	3,488 sq. yds.	8,120 sq. yds.	8,069 sq. yds.	25,069 sq. yds.	1,449 sq. yds.	2,321 sq. yds.							80,311 sq. yds.
Curbstones set	32,931 lin. ft.	1,540 lin. ft.	2,028 lin. ft.	2,295 lin. ft.			9,955 lin. ft.	1,072 lin. ft.	1,297 lin. ft.				123 lin. ft.			51,211 lin. ft.
Water-pipe, 12 in.	10,026 lin. ft.	1,710 lin. ft.					200 lin. ft.	100 lin. ft.				1,332 lin. ft.				13,368 lin. ft.
" 10 in				523 lin. ft.	4,686 lin. ft.		3,380 lin. ft.		844 lin. ft.							9,433 lin. ft.
" 8 in.	252 lin. ft.		1,020 lin. ft.	3,197 lin. ft.	1,550 lin. ft.				17 lin. ft.			1,179 lin. ft.				7,215 lin. ft.
" 6 in.	137 lin. ft.	366 lin. ft.	1,000 lin. ft.				4,695 lin. ft.		27 lin. ft.		234 lin. ft.	118 lin. ft.				6,487 lin. ft.
" 4 in.							1,692 lin. ft.					376 lin. ft.				1,975 lin. ft.
Reservoir							1									1
Hydrants	44		2		2	3	13		2		2	7	1			76
Drinking-fountains							9		1	2	5	2	1			20
Watering-trough for horses							1									1
Brick drains, 4 ft. 6 in					1,310 lin. ft.											1,310 lin. ft.
" 2 ft. 9 in							706 lin. ft.									706 lin. ft.
" 2 ft. ×2 ft. 6 in.							180 lin. ft.									180 lin. ft.
" 2 ft. 0 in							859 lin. ft.						1,300 lin. ft.			2,159 lin. ft.
Pipe drains, 18 in			1,270 lin. ft.		243 lin. ft.	465 lin. ft.	3,540 lin. ft.					561 lin. ft.				6,079 lin. ft.
" 15 in.	778 lin. ft.			762 lin. ft.		298 lin. ft.	2,895 lin. ft.					196 lin. ft.		977 lin. ft.		5,896 lin. ft.
" 12 in.	452 lin. ft.			350 lin. ft.	183 lin. ft.	612 lin. ft.	2,023 lin. ft.					130 lin. ft.		976 lin. ft.		4,735 lin. ft.
" 10 in.	829 lin. ft.		294 lin. ft.	524 lin. ft.	2,203 lin. ft.	402 lin. ft.	2,785 lin. ft.					606 lin. ft.	253 lin. ft.	1,501 lin. ft.	100 lin. ft.	9,557 lin. ft.
" 8 in.	6,832 lin. ft.	4,210 lin. ft.	4,685 lin. ft.	418 lin. ft.	1,592 lin. ft.	2,641 lin. ft.	10,301 lin. ft.	819 lin. ft.	1,373 lin. ft		1,739 lin. ft.	2,581 lin. ft.	823 lin. ft.	245 lin. ft.	698 lin. ft.	38,959 lin. ft.
" 6 in.	263 lin. ft.	332 lin. ft.	186 lin. ft.	1,070 lin. ft.	1,320 lin. ft.		2,640 lin. ft.			95 lin. ft.			182 lin. ft.			6,088 lin. ft.
" 4 in.							190 lin. ft.									190 lin. ft.
Agricultural tile drains, 4 in.			240 lin. ft.				2,670 lin. ft.							185 lin. ft.		2,995 lin. ft.
" " 3 in.						3,065 lin. ft.	3,520 lin. ft.						328 lin. ft.			6,913 lin. ft.
" " 2 in.						2,353 lin. ft.	26,783 lin. ft.					3,287 lin. ft.		6,969 lin. ft.		39,392 lin. ft.
" " 1½ in.					3,425 lin. ft.	3,410 lin. ft.	27,470 lin. ft.					1,859 lin. ft.		44,928 lin. ft.		80,192 lin. ft.
Total drains	9,154 lin. ft.	4,542 lin. ft.	6,675 lin. ft.	3,114 lin. ft.	10,342 lin. ft.	13,246 lin. ft.	86,402 lin. ft.	819 lin. ft.	1,373 lin. ft.	95 lin. ft.	1,739 lin. ft.	9,229 lin. ft.	1,588 lin. ft.	56,181 lin. ft.	798 lin. ft.	205,357 lin. ft.
Flush tank							1									1
Manholes	10	2	4	11	10	2	78	1			17	10	3	7	1	156
Catch-basins and inlets	107	63	43	18	45	64	187	8	11		19	14	14	10	8	611
Open channel for brook						1,175 lin. ft.	2,300 lin. ft.							3,330 lin. ft.		7,005 lin. ft.
Electric light cable	18,863 lin. ft.	7,433 lin. ft.	14,500 lin. ft.	4,330 lin. ft.	8,152 lin. ft.		13,865 lin. ft.		2,683 lin. ft.			5,801 lin. ft.				75,657 lin. ft.
Electric lights	51	20	53	12	22		35		10	33	13	20	4			273
Gateways						4	4									8
Bridges and culverts*	8	6	12		2	4	5		1 iron pier.	1		1				40
Boundary wall						2,113 lin. ft.	4,436 lin. ft.				2,228 lin. ft.		736 lin. ft.		317 lin. ft.	9,830 lin. ft.
Buildings	1	3	1	1			7		1		2	2	1			19
Flagg-staffs				1			1				1		1			5
Area of ground finished	109 acres.	36 acres.	43 acres.	13.2 acres.	10.6 acres.	155 acres.	344 acres.	1.5 acres.	15.5 acres.		10 acres	5.5 acres.	3.4 acres.	42 acres.	1.4 acres.	730.1 acres.
Flumes														2		2
Retaining-wall	688 lin. ft.	676 lin. ft.	2,343 lin. ft.	1,525 lin. ft.			3,690 lin. ft.								752 lin. ft.	9,674 lin. ft.
Slope-wall				1,171 sq. yds.												1,171 sq. yds.
Gate-chambers	1	1		1								3				6
Cinder track											2,821 sq. yds.	3,081 sq. yds.				5,902 sq. yds.
											0.2 mile.	0.25 mile.				0.45 mile.
Fence	8,750 lin. ft.	99 lin. ft.	261 lin. ft.	694 lin. ft.							3,412 lin. ft.	1,345 lin. ft.		767 lin. ft.		15,328 lin. ft.
Tennis courts							40					1		4		45

* Eight of these bridges are partly in Brookline.

E.

[FROM THE CITY ENGINEER'S REPORT TO THE STREET DEPARTMENT.]

The following is a report of the work done under my direction for the Street Department during the year 1896 : —

Blue Hill Avenue.

The work on this avenue from Grove Hall to Walk Hill street, a distance of 2.21 miles, is in a forward state. It is substantially completed from Grove Hall to the principal entrances to Franklin Park, and the remaining portion was so far advanced, that one fairly good roadway for the entire length under construction was in use during the winter. During the year the excavation or rough grading has been completed, the work on the sewers, water and gaspipes has been carried forward nearly to completion, and about one-half the work of roadway construction done. The avenue to Walk Hill street should be completed during the working season of 1897.

The construction of the remaining part of the avenue from Walk Hill street to Mattapan, a distance of .65 mile, has not yet been ordered.

The total amount of excavation made has been as follows : —

Earth	136,984.53	cubic yards.
Rock	33,913.59	" "
Total	170,898.12	" "

There has been a large surplus of excavated material, and after completing the filling required, the remainder has been disposed of as follows : —

Delivered on Lauriat avenue (haul about 0.46 mile),	7,524 cu. yds.
" " Geneva " (" " 1.67 "),	6,083 "
" " Columbus avenue between Dimock street and West Walnut Park (haul about 1.60 miles)	7,899 "
Delivered on Talbot avenue (haul about 0.17 mile),	5,000 "
Total	26,506 "

In addition to the above, large and unmeasured quantities of filling have been delivered on Franklin Field, Franklin Park, and on Blue Hill avenue beyond Walk Hill street. On the section

nearest Grove Hall, the surplus, amounting to 3,291 cubic yards, was disposed of by the contractor under the contract. A large part of the rock excavated was of such inferior quality as to be only suitable for filling. From the cut near Walk Hill street, however, suitable stone was found, and enough was saved to furnish stock for Telford base for about 16,000 square yards or about 1.07 miles of one roadway.

The total cost of excavation including its delivery as above indicated has been as follows: —

Earth, 136,984.53 cubic yards	$57,603.44
Average cost per cubic yard	0.4205
Rock, 33,913.59 cubic yards	35,620.87
Average cost per cubic yard	1.05

Most of the work remaining to be done is under contract and partially completed. There remains one section of roadway, from Glenway street to Canterbury street, which can be put under contract on the completion of the sewer, gas and water-pipe work. The construction of a retaining-wall next Franklin Park must follow the completion of the above-named section of roadway, as its site is now occupied by the temporary roadway.

The Street railroad has been rebuilt from Grove Hall, and extended .95 mile to Harvard street.

The grade established for Blue Hill avenue caused a cut of about 11 feet at the entrance to Back street (now Harvard street) and a temporary connection was made between them; this was done by contract and is not yet entirely completed. The cost will be about $1,110.

At McLellan street the difference in grade was about 10.5 feet and excavation for a connection has been in progress by the Street Department during the winter; at other intersections, where there are only slight differences in grade, connections will be made by the contractors.

Columbus–Avenue Extension.

Columbus avenue, from Northampton street to the Roxbury crossing, has been substantially completed. It has an asphalt roadway, from curb to curb, 54 feet in width, with a double-track street railway. The rails used are full-grooved, with both tread and guard on a level with the asphalt surface.

From Northampton street to the southerly line of Terry street, a distance of 3,276 feet, the surface is Trinidad asphalt, laid by the Barber Asphalt Paving Company, the concrete base is generally 6 inches in thickness, but for a part of the length over the deepest mud the thickness was increased to 10 inches. The remainder of the work, 884 feet in length, was laid on a 6-inch concrete base by the Boston Asphalt Company, with imported Sicilian natural rock asphalt. The preparation of the

roadbed was made by the regular force of the Street Department, large quantities of unsuitable material was removed, and 10,987 cubic yards of gravel was delivered by contract and used for grading. A steam-roller was kept in use upon it for several months, and while settlement is apparent in places, the general result is better than could have been reasonably expected, when the very bad character of the ground is taken into account. The edgestones were set and the brick sidewalks laid under the supervision of the Street Department. The price paid for asphalt, including a 6-inch base of American cement concrete, was $2.90 per square yard for both sections. The section of the avenue from Massachusetts avenue to Northampton street was surfaced with Trinidad asphalt, so that Columbus avenue now has a continuous asphalt surface from the Boston & Albany railroad bridge to the Roxbury crossing, a distance of 1.5 miles.

The section of the avenue between Roxbury crossing and Stony brook, near Ritchie street, is occupied at present by the contractors for the new conduit for Stony brook, and the surfacing of the street can only be commenced upon the completion of this work, and the work upon the other sewers, gas and water pipes.

The section between Ritchie street and West Walnut park can be put under contract upon the completion of the underground pipe work, which is in a forward state. The remaining section of the avenue, extending from West Walnut park to Walnut avenue, is nearly completed. It is a Telford macadam roadway with edgestones and brick sidewalks. It was let in one contract. The surplus excavated material was used upon the adjoining section, and the work was carried far enough before it was closed by the weather, to allow the roadway to be kept open during the winter.

It is expected that the avenue can be completed during the working season of 1897.

Huntington Avenue.

This avenue extends from Copley square to the Brookline line, a length of 2.25 miles. From Copley square to Francis street, a distance of 1.75 miles, it is 100 feet in width, and is built with a central reserved space 25 feet wide for street cars, two roadways each 25 feet wide and two sidewalks each 12½ feet wide. The remainder of the avenue is 80 feet in width, with one roadway 54 feet in width, with a double track street railway in the centre, built in the usual manner without a special reservation. The sidewalks are each 13 feet wide. Beginning at Copley square the first section .13 of a mile long, to the Boston & Albany railroad bridge, has Telford macadam roadways and brick sidewalks. This section was built by the regular force of the Street Department. The bridge over the railroad was stripped, cleaned, painted and newly floored above the iron girders. One new girder

was added to carry a new 42-inch water pipe, and in rebuilding, the surface of the bridge was rectified to correspond with the revised grade and cross section of the avenue.

From the bridge to Gainsborough street, a distance of .57 of a mile, the roadways are laid with natural rock asphalt, on a 6-inch American cement concrete base. The grading was done by the regular force of the Street Department. The edgestones and brick sidewalks were laid by contract with materials furnished by the department. The asphalt including base was laid by the Boston Asphalt Company and cost $2.90 per square yard. The intersection at Massachusetts avenue which has double street railroad tracks on each avenue, connected by eight curves, is paved with granite blocks on gravel. The next section, from Gainsborough to Longwood avenue .78 of a mile in length has Telford macadam roadways and gravel sidewalks; it was built by H. Gore & Co. with materials principally furnished by the Street Department. The remainder of the avenue, .74 of a mile in length has Telford macadam roadways and was built by Doherty & Connors, with materials furnished by the Street Department. A few details remain to be completed upon this avenue and the work done upon it late in the season will require some further attention early in the spring.

The reserved space upon which the street cars run has been loamed, with the intention of seeding it to grass; this work has been done by the West End Street Railway Company which has also done similar work upon Commonwealth-avenue extension and Blue Hill avenue.

BRIGHTON AVENUE.

This avenue extends from Commonwealth avenue to Union square, Allston, a length of .67 of a mile. It is 100 feet wide, with a central loamed reservation 25 feet wide, for street cars, two roadways, the northerly one 30 feet wide, and the southerly one 25 feet wide, and two sidewalks, each 10 feet wide. The roadways are built of Telford macadam, with 10-inch base and 6-inch cracked stone covering, with block stone gutters, edgestones and gravel sidewalks.

The work was done by Doherty & Connors, with materials (except gutter blocks and flagging) furnished by the Street Department. The surplus excavated material was deposited on Commonwealth avenue, near Cottage-Farm bridge. The work of building has been completed, with the exception of repairing such defects as may develop during the winter.

COMMONWEALTH–AVENUE EXTENSION.

The extension of Commonwealth avenue to the Newton line has been so far completed as to be in use during the winter. Some work is yet to be done, and work done late in the season will require attention in the spring. The avenue has been in use

since September. The work of excavation under Neil McBride's contract, let in 1895, was completed early in the year, and large quantities of excellent stone for Telford base and for crushing, including a quantity of the finest trap rock, was quarried and stored on adjoining land, and enough to supply the city's crusher was delivered daily at the Chestnut Hill avenue crusher, near by. Substantially enough stone was quarried and saved to build the roadways and furnish a foundation for the sidewalks. The work of building the avenue was let to John A. Whittemore's Sons, in May, 1896. Block stone for gutters was furnished by the Street Department, and the contractors hauled the stone previously quarried and not required for Telford base to the crusher, and drew crushed stone from the stock there as required. The roadways are built with an 8-inch Telford base and 4-inch crushed stone surface, block stone gutters, without edgestones, and gravel sidewalks, with broken stone foundation.

The width of the avenue at this section is 120 feet. The northerly roadway is 25 feet wide, the southerly roadway 40 feet wide, the reserved and loamed space for street cars is 25 feet wide, and the two sidewalks are each 15 feet wide.

The stone arch which marked the entrance to the Chestnut Hill Driveway was taken down and stored on the grounds of the Water Department by William Miller, at the contract price of $874. The face wall on the Water Department front on the avenue was rebuilt in its new position at a cost of $1,684.10. The contracts of both McBride and Whittemore are not yet settled.

The construction of this section completes the connection between Commonwealth avenue in Boston, and Commonwealth avenue in Newton, making a continuous wide avenue extending from the Public Garden in Boston to Charles river on the further boundary of the city of Newton, a distance of 11.14 miles, 5.59 miles of this avenue being in Boston, and 5.55 miles in Newton.

The table showing lengths and areas of paving on accepted streets has been brought up to Feb. 1, 1897.

Street paving has been supervised in all cases where requested. All paving laid on the before-mentioned avenues is included in the quantities given. All granite paving laid on concrete base has been laid with pitch and pebble joints.

Block stone pavement, on a concrete base, laid with pitch and pebble joints, 9,308.9 square yards.

Block stone pavement, on a gravel base, laid with pitch and pebble joints, 5,752 square yards.

Block stone pavement, on a gravel base, laid with gravel joints, 29,046.7 square yards.

Trinidad sheet asphalt, with a binder course of asphaltic cement concrete on an American cement concrete base, 24,782.76 square yards, at a cost of $2.90 per square yard for large areas, and $3 per square yard for small areas, not including the preparation of the roadbed.

Sicilian rock asphalt on an American cement concrete base, 26,717.2 square yards, at an average cost of about $2.90 per

square yard for large areas, and $3 per square yard for small areas, not including the preparation of the roadbed.

Edgestones set, 107,833 linear feet; gutter paving laid and relaid, 44,823.3 square yards; brick sidewalks laid, 49,314.2 square yards; gravel sidewalks constructed, 43,888.3 square yards; flagging crosswalks laid, 6,044.16 square yards.

All asphalt paving is laid with a maintenance guarantee for five years.

Acton street, Washington street to Bradford street, was paved with 2½ inches of Sicilian rock asphalt, on a 6-inch American cement concrete base, by the Boston Asphalt Company. The roadway was subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Street Department. The former surface was macadam, with cobble-stone gutters. One new catch-basin was built on Bradford street, and one square granite catch-basin frame was removed and a cast-iron D frame substituted.

Batterymarch street, Milk street to Liberty square, was paved with 2 inches of Trinidad lake asphalt, with 1½-inch bituminous concrete binder, on a 6-inch American cement concrete base, by the Barber Asphalt Paving Company. The old pavement was removed and the roadway subgraded by the Paving Division. Edgestones were reset, brick sidewalks and flagging crosswalks relaid by D. J. Kiley. Two square granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, old granite blocks.

Beach street, Washington street, across Harrison avenue, was paved with large granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints, including tracks of the West End Street Railway Company. The old pavement was barred out and loaded, roadway subgraded, concrete base and paving laid, the edgestones reset, brick sidewalks and flagging crosswalks were relaid by J. B. O'Rourke. The Street Department furnished teams for carting away old paving blocks and surplus material. The West End Street Railway Company, by agreement, paid for the portion within its tracks. Former pavement, old granite blocks.

Chauncy street, Summer street to Essex street, was paved with large granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints, including the tracks of the West End Street Railway Company. The old pavement was barred out and loaded, roadways graded, concrete base and paving laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Metropolitan Construction Company. The Street Department furnished teams for carting away old granite blocks and surplus material. The West End Street Railway Company, by agreement, paid for the portion within its tracks. Former pavement, old granite blocks.

Corning street, Shawmut avenue to Washington street, was resurfaced with Trinidad lake asphalt by the Barber Asphalt

Paving Company. This work was done by the burning process, which consists in heating the old surface of the asphalt, scraping off the dead asphalt, and applying a new wearing surface. The price paid for this work was $2 per square yard.

Columbus avenue, Massachusetts avenue to Northampton street, was paved by the Barber Asphalt Paving Company with 2 inches of Trinidad lake asphalt, with 1½ inches bituminous concrete binder, on a 6-inch American cement concrete base. The roadway was subgraded by J. J. Sullivan; edgestones were reset, brick sidewalks and flagging crosswalks relaid by Philip Doherty. Former surface was macadam with block gutters.

Devonshire street, State street to Dock square, was paved with large granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints, including tracks of the West End Street Railway Company. The old pavement was removed and roadway subgraded by the Street Department. Concrete base and paving laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by J. B. O'Rourke. The West End Street Railway Company, by agreement, paid for the portion within its tracks. At the Dock-square end of the street, about 100 square yards were repaved on a gravel base temporarily, so that the Boston Transit Commission might readily make certain gas pipe connections. Former pavement, old granite blocks on a gravel base.

Hamburg street, Mystic street to Harrison avenue, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base, by the Boston Asphalt Company. The roadway was subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid, by the Street Department. Former surface was macadam, with cobble gutters. Two square granite catch-basin frames were removed, and cast-iron D frames substituted.

Hanover street, Tileston street to Charter street, and across Charter street on the north side, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base, by the Boston Asphalt Company. The old pavement was removed and roadway subgraded by the Street Department. Edgestones were reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. One square granite catch-basin frame was removed and a cast-iron D frame substituted. Former pavement was old granite blocks on a gravel base.

K street, East Sixth street to East Eighth street, not including tracks of the West End Street Railway Company, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base by the Boston Asphalt Company. The roadway was subgraded by the Street Department. Edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. Former surface was macadam with cobble-stone gutters. The laying of the concrete base and asphalt surface was supervised by the Street Department.

Laconia street, Washington street to Harrison avenue, was paved with 2 inches of Trinidad Lake asphalt on 1½-inch bituminous

concrete binder, on a 6-inch American cement concrete base, by the Barber Asphalt Paving Company. This street was formerly a private way, with brick sidewalks on either side, and a parkway in the centre with two rows of trees; the usual cross section for a street of this width was modified so as to preserve the best of the trees in the northerly row. The roadway was subgraded, edgestones reset, brick sidewalks and flagging crosswalks laid by the Street Department. Two new catch-basins were built.

Lowell street, Causeway street to Brighton street (including tracks of the West End Street Railway Company and Union Freight Railroad Company), was paved with large granite blocks on a gravel base and bed, with pitch and pebble joints. The old pavement was removed and the roadway subgraded by the Street Department. Block paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by D. J. Kiley & Co. By agreement, the West End Street Railway Company and the Union Freight Railroad Company paid for the portion within their tracks. Three granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, old granite blocks on a gravel base.

Meander street, Malden street to East Dedham street, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base, by the Boston Asphalt Company. The roadway was subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Street Department. Two square granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, cobble stones on gravel base.

Milk street, Oliver street to India street, was paved with large granite blocks on a 6-inch American cement concrete base. The old pavement was removed and roadway subgraded by the Street Department. Concrete base and paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by Jones & Meehan. Four square granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, old granite blocks on a gravel base.

Mystic street, Malden street to East Brookline street, was paved with 2½ inches of Sicilian rock asphalt, on a 6-inch American cement concrete base by the Boston Asphalt Company. The old pavement was removed, roadway subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Paving Division. Four new catch-basins were built. Former pavement was 12-inch square granite blocks on gravel base, between Malden and East Canton streets, and macadam between East Canton and East Brookline streets.

North street, Merchants row to Blackstone street, was paved with large granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints. The old pavement was barred out and loaded, roadway subgraded, concrete base and paving laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Metropolitan Construction Company. The Street

Department furnished teams for carting away old blocks and surplus excavation. Two granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, old granite blocks on a gravel base.

Norwich street, Mystic street to Meander street, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base by the Boston Asphalt Company. The old pavement was removed and roadway subgraded, edgestones reset, and brick sidewalks relaid by the Street Department. Two square granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement, cobble stones on gravel base.

Ohio street, Washington street to Shawmut avenue, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base by the Boston Asphalt Company. The old pavement was removed and roadway subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Street Department. Former pavement, old granite blocks on gravel base.

Pine street, Washington street to Harrison avenue, was paved with 2 inches of Trinidad Lake asphalt, with 1½ inches bituminous concrete binder on a 6-inch American cement concrete base by the Barber Asphalt Paving Company. The roadways were subgraded, edgestones reset, brick sidewalks and flagging crosswalks relaid by the Street Department. One new catch-basin was built, and one square granite catch-basin frame was removed and a cast-iron D frame substituted. Former pavement was macadam with block gutters.

St. Martin street, Bunker Hill street to Medford street, is about 533 feet long, with a difference in level between the above-named streets of 55 feet; from Medford street it rises at the rate of 14.34 feet per 100 for 170 feet; from this point five flights of artificial stone steps and platforms, 61 feet long and rising 25.8 feet, were built by Simpson Bros., at a cost of $2,811.20. Iron hand rails and fences were built by G. T. McLauthlin & Co., at a cost of $310. The excavation was made and foundations prepared by the Street Department. The portion of the street 170 feet from Medford street is to be constructed with a macadam roadway, granite block gutters, edgestones and brick sidewalks. The work of constructing the street was not very far advanced at the end of the working season.

Taylor street, Dwight street to Milford street, was paved with Sicilian rock asphalt on the existing concrete base, by the Boston Asphalt Company. Two granite catch-basin frames were removed and cast-iron D frames substituted. Former pavement was Trinidad lake asphalt. The laying of the asphalt was supervised by the Street Department.

Water street, Liberty square to Broad street, was paved with 2 inches Trinidad Lake asphalt, with 1½ inches bituminous concrete binder, on a 6-inch American cement concrete base by

the Barber Asphalt Paving Company. The old pavement was removed and roadway subgraded by the Street Department. Edgestones reset, brick sidewalks and flagging crosswalks relaid by D. J. Kiley. Former pavement, old granite blocks on a gravel base.

Winter street, Tremont street to Washington street, was paved with special cut granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints. The old pavement was removed and roadway subgraded by the Street Department. Concrete base and paving laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. Former pavement, old granite blocks on a gravel base.

New Streets.

The following streets were constructed under chapter 323 of the Acts of the Legislature of Massachusetts of 1891, and Acts in amendment thereof or in addition thereto : —

Abbotsford street, Walnut avenue to Harold street, is about 599 feet long. The contract for constructing the surface of this street was awarded to Quimby & Ferguson. Work was begun June 16, 1896, and completed Aug. 29, 1896, at a total cost of $1,864.03. It is a 6-inch macadam road with gravel sidewalks. Crushed stone, gutter blocks and edgestones were furnished by the city and hauled to the site of the work by the contractors. Flagging for crosswalks was furnished by the contractors.

Audubon road, Beacon street across Ivy street, is about 315 feet long. The contract for constructing the surface of this street was awarded to William Scollans. Work was begun June 29, 1896, and completed Sept. 10, 1896, at a total cost of $5,813.83. This street is 100 feet wide ; it has a 60 feet roadway, two brick sidewalks 10 feet wide, and a planting space on either side between the sidewalk and roadway. The roadway is Telford macadam (8 inches and 4 inches respectively) with granite block gutters. Telford stone, crushed stone, edgestone and gutter blocks were furnished by the city and hauled to the site of the work by the contractor. Bricks, loam and flagging for crosswalks were furnished by the contractor.

Bay State road, Sherborn street to Granby street, is about 795 feet long. The contract for constructing the surface of this street was awarded to Quimby & Ferguson. Work was begun May 4, 1896, and completed Sept. 11, 1896, at a cost of $3,749.02. It is a 6-inch macadam road with gravel sidewalks. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor. Gutter blocks and flagging for crosswalks were furnished by the contractor.

Boylston street extension, Boylston road to Brookline avenue, is about 2,070 feet long. The work of filling to sub-grade

was begun in 1894, and completed on April 27, 1895, at a cost of $47,819.37. The contractor was John O'Brien. A contract for constructing the surface of this street was awarded to Neil McBride. Work was begun Oct. 20, 1896, and is still incomplete. It is a 6-inch macadam road, with gravel sidewalks. Crushed stone and edgestones are furnished by the city and hauled to the site of the work by the contractor. Gutter blocks are furnished and delivered on the street by the city. Flagging for crosswalks was furnished by the contractor. Before the cold weather stopped work, the contractor had set all the edgestones, paved the gutters and placed nearly all the crushed stone. During the winter, as the weather permitted, he has been hauling in gravel to fill out the slopes.

Clinton street, Fulton street to Commercial street, is about 187 feet long. This street was widened 30 feet on the northerly side; it is now 70 feet wide. For taking down a building at the corner of Fulton street and removing old area and party walls, the sum of $643.05 was paid to A. A. Elston & Co. The old pavement was barred out and roadway subgraded by the Street Department. The order for construction required granite block paving on a concrete base, with pitch joints, but, as it is intended to build part of an outfall sewer in the street, the roadway was paved temporarily with granite blocks on a gravel base. The granite block paving was laid, edgestones set, brick sidewalks and flagging crosswalks relaid by Dennis J. Kiley & Co.

Fenelon street, Washington street to Merrill street, is about 324 feet long. The contract for constructing the surface of this street was awarded to Daniel E. Lynch. Work was begun Oct. 19, 1896, and was continued as long as the weather permitted; it is very nearly completed. The street has a 6-inch macadam road, with gravel sidewalks. Crushed stone, gutter blocks and edgestones were furnished by the city, and hauled to the site of the work by the contractor. Flagging for crosswalks was furnished by the contractor.

Geneva avenue, Westville street to Dorchester avenue, is about 2,137 feet long. The contract for constructing the surface of this street was awarded to Finneran & O'Hearn. Work was commenced Nov. 13, 1896, and was continued as long as the weather permitted. It is a 6-inch macadam road, with gravel sidewalks. Crushed stone and edgestones are furnished by the city, and hauled to the site of the work by the contractor; gutter blocks are furnished and delivered on the street by the city; flagging for crosswalks is furnished by the contractor. The street is practically finished for a distance of about 600 feet.

Granby street, Commonwealth avenue to Charles river, is about 439 feet long. The contract for constructing the surface of this street was awarded to Quimby & Ferguson. Work was begun May 8, 1896, and completed Sept. 11, 1896, at a cost of $2,203.22. It is a 6-inch macadam road, with gravel sidewalks. Crushed stone and edgestones were furnished by the city, and

hauled to the site of the work by the contractor; gutter blocks and flagging for crosswalks were furnished by the contractor. A contract for furnishing and setting a capstone on the sea wall at Charles river was awarded to Trumbull & Ryan; capstone, 64 feet long, cost $320.00. Another contract for furnishing and erecting an iron fence on the above capstone was awarded George T. McLauthlin & Co. for $110.00.

Greenbrier street, Bowdoin street to Bloomfield street, is about 700 feet long. The contract for constructing the surface of this street was awarded to Quimby & Ferguson. Work was begun June 16, 1896, and completed Oct. 8, 1896, at a cost of $2,797.05. It is a 6-inch macadam road with gravel sidewalks. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor; gutter blocks and flagging for crosswalks were furnished by the contractor.

Josephine street, Geneva avenue to Ditson street, is about 627 feet long. The contract for constructing the surface of this street was awarded to J. J. Nawn. Work was begun June 4, 1896, and completed Oct. 16, 1896, at a cost of $1,888.66. It is a 4-inch macadam road. Gravel sidewalks were ordered to be built, but on account of a petition from the abutters, a granolithic sidewalk and edgestone was laid, except in front of two lots. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor. Gutter blocks and flagging for crosswalks were furnished by the contractor

Lauriat avenue, Blue Hill avenue to Tucker street, is about 3,160 feet long. The contract for constructing the surface of this street was awarded to Doherty & Connors; work was begun Oct. 5, 1896, and was continued as long as the weather permitted. It is a 6-inch macadam road with gravel sidewalks. Crushed stone, gutter blocks and edgestones are furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks is furnished by the contractor. This street is practically finished for a distance of about 1,950 feet.

Morse street, Washington street to Bowdoin avenue, is about 223 feet long. The contract for constructing the surface of this street was awarded to Daniel E. Lynch. Work was begun Oct. 12, 1896, and was continued as long as the weather permitted; it is nearly completed. This street has a 6-inch macadam road with gravel sidewalks. Crushed stone, gutter blocks and edgestones were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

St. Alphonsus street, Tremont street to Calumet street, is about 720 feet long. The contract for constructing the surface of this street was awarded to Quimby & Ferguson. Work was begun June 24, 1896, and completed Oct. 10, 1896, at a cost of $3,608.62 It is a 6-inch macadam road with gravel sidewalks. Crushed stone, gutter blocks and edgestones were furnished by

the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor. The above contract includes building about 187 feet of retaining-wall, average height about 7.5 feet.

Wilder street, Washington street to Geneva avenue, is about 539 feet long. The contract for constructing the surface of this street was awarded to Finneran & O'Hearn. Work was begun Oct. 5, 1896, and was practically finished Nov. 28, 1896; a small amount of work remains to be done to finish the surface of the roadway. It is a 6-inch macadam roadway. Gravel sidewalks were ordered to be built, but at the request of the owner of abutting land they were omitted, so as to allow him to lay granolithic next season. Crushed stone, gutter blocks and edgestones were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

Streets were filled to subgrade, by the Metropolitan Construction Company, as follows: —

Norway street, from Massachusetts avenue to Parker street, 2,541 cubic yards, at 50 cents = $1,270.50.

Ruggles street, from Parker street to Back Bay Fens, 7,496 cubic yards, at 65 cents = $4,872.40

Turner street, from Haviland to Astor streets, 2,380 cubic yards, at 50 cents = $1,190.

Vancouver street, from Huntington avenue to Ruggles street, 1,444.6 cubic yards, at 65 cents = $938.99.

Peterborough street, Boylston road to Audubon road, is about 1,833 feet long. A contract for filling this street to subgrade was made with the Boston & Albany Railroad Company, on Oct. 30, 1896, at the rate of 51 cents per cubic yard measured in the cut. Work was begun under this contract, Dec. 2, 1896.

Grading Street Railway Tracks.

The grades for tracks in the following streets have been determined. On streets marked * the surveys were made and levels taken by the companies.

(*West End Street Railway.*)

Alford street, from Malden Bridge to the Everett line.

Amory street, Roxbury, from Centre street to the car-house.

Beach street, from Washington street across Harrison avenue.

Beacon street, from Massachusetts avenue to Deerfield street.

Blue Hill avenue, from Washington street to 1,200 feet south of Back street.

Centre street, Roxbury, at Linwood street.

Centre street, Roxbury, from Columbus-avenue extension to near Wise street.

Chauncy street, from Summer street to Essex street.

* *Chestnut Hill avenue*, from Commonwealth avenue to Sutherland road.

Columbus avenue, from Massachusetts avenue to Roxbury crossing.

Columbus avenue, from West Walnut Park to Washington street.

Commonwealth-avenue extension, from Chestnut Hill avenue to the Newton line.

Devonshire street, from State street to Dock square.

Dorchester avenue, from West First street to West Seventh street.

East Eighth street, from Dorchester street to Mercer street.

East Sixth street, from L street to N street.

Essex street, from Washington street to Harrison avenue.

Hanover street, from Tileston street to Charter street.

Huntington avenue, from Dartmouth street to the Brookline line.

K street, from East Sixth street to East Eighth street.

Main street, Charlestown, from City square to Pleasant street.

Main street, Charlestown, from Wood street to School street.

* *Market street, Brighton*, from Western avenue to Washington street.

* *Massachusetts avenue*, from Boylston street to Huntington avenue.

* *Roxbury street*, from Pynchon street to Eliot square.

Sumner street, East Boston, from Orleans street to Webster street.

Tremont street, from Columbus avenue to Vernon street.

Tremont street, Brighton, from Oak square to Newton line.

† *Washington street*, from Elm street to Haymarket square.

Washington street, Roxbury, from Vernon street to Warren street.

* *Western avenue*, from Charles river in Cambridge to Market street.

West Fourth street, at Dorchester avenue.

(*West Roxbury and Roslindale Street Railway Company.*)

* *Beech street*, from Centre street to Belgrade avenue.

* *Brandon street*, from Amherst street to South street.

* *Centre street*, from Beech street to Alaric street.

* *South street*, from Brandon street to Washington street.

* *Washington street*, from Forest Hill station to the Dedham line.

Total length of single track grades, 29.4 miles.

Surveys and plans were made for work upon the following streets and grades and lines given. The work of construction was supervised by the Street Department: —

† Survey by the Boston Transit Commission.

Albany street, from Massachusetts avenue toward East Concord street, was repaved with granite blocks on a gravel base, on account of the paving of Massachusetts avenue, between Albany street and Swett street, and raising it to the established grade. The old paving was barred out and bed prepared by the Street Department. The roadway was repaved, edgestones reset, brick sidewalks and flagging crosswalks relaid by Doherty & Connors.

Arlington street, from Boylston street to Marlborough street, was resurfaced with macadam by the Street Department. Gutters relaid, edgestones reset, brick sidewalks and flagging crosswalks relaid by James Grant & Co.

Ashland street, from Chambers street to Leverett street, was paved with large granite blocks on a gravel base. The old pavement was removed and roadway subgraded by the Street Department. Granite block paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by D. J. Kiley. Former pavement was cobble-stones.

City Hall avenue, a footway from School street to Court square, was paved with Hastings asphalt blocks on a gravel bed, blocks were laid on their broadest faces by H. Gore & Co. The old pavement was removed, walk subgraded and bed furnished and placed by the Paving Division. Blocks were furnished by H. Gore & Co. Former surface was brick on gravel base.

Commonwealth avenue, from Cottage-Farm bridge to Warren street. Lines and grades were given and work measured, east and west of Cottage-Farm bridge and between Harvard avenue and Allston street.

D street, from West First street to West Third street, was paved with large granite blocks on a gravel base. The roadway was subgraded by the Paving Division. Granite block paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. Former surface was macadam.

Dorchester avenue, from West First street to West Seventh street, was repaved with large granite blocks on a gravel base. The old pavement was removed and roadway subgraded by the Street Department. Granite block paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. Former pavement, old granite blocks on granite base.

East Eighth street, from Dorchester street to Mercer street (on southerly side between edgestone and car track), was paved with large granite blocks on a gravel base. The old pavement was removed and roadway subgraded by the Street Department. Granite block paving was laid by H. Gore & Co. Former pavement was old granite blocks on gravel base.

East Sixth street, from L street to N street, was paved with large granite blocks on a gravel base. The roadway was subgraded in part by the Street Department and in part by H. Gore & Co. Granite block paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. Former surface was macadam with cobble-stone gutters.

Eustis street, from Hampden street to Magazine street, was resurfaced with macadam by the Street Department. Cobblestone gutters were relaid, edgestones reset, and brick sidewalks relaid (including excavation) by C. E. Barnes.

Massachusetts avenue, from Albany street to Swett street, was paved with large granite blocks on a gravel base. The roadway was subgraded by the Street Department. Granite block paving was laid, edgestones set and flagging crosswalks laid by Doherty & Connors. Five new catch-basins were built. Former surface was macadam.

Tremont street, from Columbus avenue to Prentiss street (on northerly side), was repaved with large granite blocks on a gravel base. The old pavement was removed and roadway subgraded by the Street Department. Granite block paving, brick sidewalks and flagging crosswalks were relaid, and edgestones reset by Jones & Meehan. Former pavement was old granite blocks on gravel base.

Miscellaneous Work.

Chestnut Hill Reservoir Archway. Specifications were prepared, and a contract made with W. L. Miller for taking down this archway. All stones were lettered and numbered, and a plan showing such numbering is on file in the office of the City Engineer. Cost of work was $874.

Commonwealth-avenue Speedway. A plan and details for swing-gates for either end of the speedway was made.

Commonwealth-avenue ledge. Plans of cross sections of ledge, for measurement of stone removed. This stone was used in the construction of Brighton avenue, Bay State road, Granby, Boylston and other streets; also plan of ledge showing outlines Oct. 1, 1895, and Dec. 5, 1896, and positions of camera when photographs of the face of the ledge were taken Dec. 10 and 11, 1896.

Boylston street, from Exeter street to Hereford street. Plan and estimate for fence.

Hawthorn gravel bank (Brookline), plan and cross sections of bank for gravel used in filling Columbus-avenue extension and Huntington-avenue widening,

Livermore gravel bank (Roxbury), plan and cross sections of bank for gravel used in filling Columbus-avenue extension.

Ruggles street, under bridge of Providence Division, New York, New Haven & Hartford railroad. Plans, elevations, sections and details of elevated sidewalk.

Surveys, plans and estimates for improving and paving the following streets have been made: —

Alford street (Charlestown), from Malden bridge to the Everett line.

Essex street, from South street to Federal street.

Milk street, from Pearl street to Kilby street.

Washington street, from Marvin street to Warren street.

MISCELLANEOUS WORK AND CONSTRUCTION IN 1896.

COTTAGE–FARM BRIDGE.

During the early part of the year the northerly roadway was completed; the 20-inch steel beams being placed in position by A. C. Richmond; the bricks, the skewbacks and concrete being furnished by the city, and put in place by the Metropolitan Construction Company. A Sicilian rock asphalt wearing surface was put on the roadway by the Boston Asphalt Company.

On the completion of the northerly roadway travel was turned on that side of the bridge July 9, and the old wooden bridge and the two iron girders supporting the water and gas pipes were removed.

New parapets and bearing blocks were furnished by the Cape Ann Granite Company, and set in position on the old bridge seats on the southerly section of the bridge.

Slight extensions were made to the easterly end of the north abutment and middle pier, the work being done by A. C. Richmond.

The 20-inch steel beams were furnished by Page, Newell & Co., and placed in position by A. C. Richmond. The lead coverings for the steel beams were furnished by E. B. Badger & Sons. The bricks, skewbacks and concrete arches between the beams were set by the Metropolitan Construction Company, the materials being furnished by the city. The asphalt surface was put on by the Boston Asphalt Company.

The two steel girders on the easterly side of the bridge, and the sidewalk floor beams connected to them were furnished in place by the Boston Bridge Works.

Granolithic sidewalks were laid on this section of the bridge by Simpson Brothers, of Boston.

A central way between the car tracks, 13½ feet wide and 5 inches above the roadway was built, upon which are placed two gas-pipes and one water-pipe.

Travel was turned over this part of the bridge late in the fall and the bridge is practically completed with the exception of the sidewalk on the northerly section, and the placing of fence rails on the main girders.

With the exception of the plate girders on the outside lines of the bridge, and some special construction under the sidewalks, the superstructures is composed of 20-inch steel beams filled between with brick arches and Portland cement concrete, on which is a wearing surface of Sicilian rock asphalt. The lower flanges of the beams are covered with sheet lead to protect them from rust and the corrosion due to gases in smoke from locomotives.

Essex-street Bridge.

Plans and specifications were prepared by this department for making extensive repairs to this bridge.

A contract was made with William S. Rendle of East Boston, on Oct. 14, 1896, for doing the work, which principally consisted in removing the top of the old bridge above the piles, from the Boston abutment to within 18 feet of the draw, replacing the poorest of the old piles with new ones and rebuilding the bridge with new hard pine caps, stringers and planking. The sidewalk was rebuilt on the down-stream side of the bridge and both fences were rebuilt. The total cost of the work was $7,038.95.

Huntington-avenue Bridge, Over Boston & Albany R.R.

During the past year the flooring of the bridge has been entirely rebuilt and made to conform to the new grade; parapets were raised and new asphalt sidewalks built. The old girder on the centre line of the westerly sidewalk was moved to the easterly sidewalk and two new plate girders put in under the westerly sidewalk. This change was made necessary because of the new 42-inch water-pipe which was carried across the bridge on the westerly side. The girders were built by the Boston Bridge Works under a contract dated Nov. 9, 1895, and the work of moving the old girder was done by the same company; the total cost being $2,646.99. The contract for the woodwork and for the changes in stonework was made with W. L. Miller, dated April 11, 1896, and amounted to $3,097.28. The sidewalks were built by the Boston Asphalt Company at a cost of $635.25. The cleaning and painting of the girders was done by the Bridge Division of the Street Department.

Meridian-street Bridge.

Specifications were made for rebuilding the trusses of the draw and a contract for doing the work was made April 11, with W. H. Ellis & Co.

After building the new chords, the draw was turned off, the floor and gallows frame were blocked up, the old trusses removed and the new ones replaced, using the truss-rods and castings of the old draw; the flooring was then refastened to the new chords; repairs were made on a few floor beams and the gallows frame, and the new woodwork was painted. The timber used in the trusses was furnished by the city.

The cost of the contract work was $2,025.96.

After the flooring was fastened to the trusses, the Bridge Division repaired the deck of the draw. The draw was turned off May 25, and travel was resumed July 1.

Winthrop Bridge.

The sidewalk and sidewalk bulkhead were rebuilt for about three-quarters of their length; three piles were driven, and ten

bents of piles were girder-capped in whole or in part, and other smaller repairs were made; the work was done by J. N. Hayes & Co., and was completed March 10, 1896, at a cost for contract work of $1,519.92.

City Hospital.

Grading and Draining Grounds. Plans and specifications having been prepared during the previous winter for grading and draining a portion of the hospital grounds, a contract was made with Dennis F. O'Connell, on February 25, for doing the work. It was completed in August at a cost of $19,657.40.

The work done consisted of draining, grading and loaming the grounds and surfacing the drives and walks on that portion of the property between the old north line of Springfield street and Massachusetts avenue. Also the building of brick walls on the lines of East Concord street, Albany street and Massachusetts avenue, where wooden fences only existed previously, and the raising and putting marble coping on the existing brick walls.

Fire System. During the latter part of the year a fire system, with the necessary supply pipes, hydrants, standpipes, hose, etc., was established in the Boston City Hospital; it embraced the older buildings constructed before the modern methods of protection from fire were introduced. In all, eighteen different buildings were thoroughly equipped.

The following materials were used in the work: —

1,600 linear feet 4 inches to 8 inches cast-iron pipe.
1,600 " " 2 inches to 4 inches wrought-iron pipe.
4,000 " " linen fire hose.
5 post hydrants.
57 fire connections with valves.
9 valves 4 inches to 8 inches.

Congress-street Grade Crossing.

At the request of the Commission appointed by the Superior Court for the alteration of the grade crossing of Congress street and the New England Railroad, this department has made the necessary surveys, and prepared the plans which have been used at the various hearings held by the Commissioners. On the tenth of November, 1896, the Commissioners prescribed the manner in which the crossing should be abolished, substantially in accordance with these plans.

Dorchester-avenue Extension.

Early in June, 1896, a party was put in the field to make surveys for the extension of Dorchester avenue along the water front, made necessary by the construction of the new South Union Terminal Station. Surveys have been made, and borings

taken for the entire distance between the proposed extension of Summer street and Federal-street bridge, and plans have been prepared for the building of a sea wall on the harbor line to maintain the filling in the proposed street. Work on this wall will commence early the coming season.

The necessary authority for the construction of the sea wall and for filling solid within the street lines has been obtained from the Secretary of War, as given in the following licenses: —

Whereas, By section 3 of an Act of Congress, approved July 13, 1892, entitled "An Act making appropriations for the construction, repair, and preservation of certain public works, on rivers and harbors, and for other purposes," it is provided that, without the permission of the Secretary of War, it shall not be lawful to build any wharf, pier, dolphin, boom, dam, wier, breakwater, bulkhead, jetty or structure of any kind outside established harbor lines, or where no harbor lines are, or may be established, in any port, roadstead, haven, harbor, navigable river, or other waters of the United States, in such manner as shall obstruct or impair navigation, commerce or anchorage of said waters; or to excavate or fill, or in any manner to alter or modify the course, location, condition or capacity of any port, roadstead, haven, harbor, harbor of refuge, or inclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless approved and authorized by the Secretary of War;

And whereas, The City of Boston, Massachusetts, has applied to the Secretary of War for permission to fill solid, to the pier line on Fort Point channel, at Boston, Massachusetts, the docks and wharves from Federal-street bridge to the northerly line of what will be the extension of Summer street, as shown on the attached drawing;

Now, therefore, This is to certify that the Secretary of War hereby gives permission to the said city to fill solid to the pier line on said channel, the docks and wharves from Federal-street bridge to the northerly line of what will be the extension of Summer street, as shown on said drawing upon the following condition: —

That said city shall make such compensation for the tide water displaced by the authorized structures as, in the opinion of the Engineer Officer of the United States Army, in charge of the locality, may be demanded for the preservation and protection of Boston Harbor; and the work herein permitted to be done shall be subject to to his supervision and approval.

Witness my hand this tenth day of July, 1896.

(Signed.)

Daniel S. Lamont,
Secretary of War.

Whereas, By section 3 of an Act of Congress approved July 13, 1892, entitled "An Act making appropriations for the construction, repair and preservation of certain public works on rivers and harbors, and for other purposes," it is provided that, without the permission of the Secretary of War, it shall not be lawful to build any wharf, pier, dolphin, boom, dam, wier, breakwater, bulkhead, jetty or structure of any kind outside established harbor lines, or where no harbor lines are, or may be established, in any port, roadstead, haven, harbor, navigable river or other waters of the United States, in such manner as shall obstruct or impair navigation, commerce or anchorage of said waters; or to excavate or fill, or in any manner to alter or modify the course, location, condition or capacity of any port, roadstead, haven harbor of refuge, or inclosure within the limits of any breakwater or of the channel of any navigable water of the United States, unless approved and authorized by the Secretary of War;

And whereas, The City of Boston, Massachusetts, has applied to the Secretary of War for permission to fill outside of the harbor line on Fort Point channel, Boston Harbor, Massachusetts, for the purpose of affording support to the sea wall to be built on said channel, as shown on the attached drawing;

Now, therefore, This is to certify that the Secretary of War hereby gives permission to said City of Boston to fill outside of the harbor line on Point Fort channel, at said place, for the purpose of affording support to the sea wall to be built on said channel, as shown on said drawing, upon the following condition:

That the work herein permitted to be done shall be subject to the supervision and approval of the Engineer Officer of the United States Army in charge of the locality.

Witness my hand this twenty-second day of September, 1896.

(Signed.)

Daniel A. Lamont,
Secretary of War.

East Boston Ferries.

At the request of the Superintendent of Streets a report was made Aug. 5, 1896, on the condition of the slips, drops and tanks of the East Boston Ferries.

South Ferry, Boston Side. Two new piers were recommended for this landing. At the request of the Superintendent of Streets specifications were made for temporarily repairing the outer part of the middle pier, and the work was done by W. H. Ellis & Co., under a contract dated Oct. 8, 1896, at a cost of $1,802.15.

New Drops. A contract was made Sept. 16, 1896, with William McKie to build three new drops to replace three old ones,

which were to be removed by the contractor and to become his property, the contract price being $14,718. These drops were placed at the northerly landing of the North Ferry, East Boston side, at the northerly landing of the South Ferry, Boston side, and at the southerly landing of the North Ferry, Boston side. These drops were respectively put in use at the following dates: Nov. 23, Dec. 7, 1896, and Jan. 26, 1897.

New Tanks. Two new tanks were built by J. M. Brooks, and were used for the new northerly drop at the East Boston landing of the North Ferry, and for the new northerly drop at the Boston landing of the South Ferry. The contract price was $3,500.

The tank used for the new southerly drop at the Boston landing of the North Ferry was taken from the Boston landing of the South Ferry and repaired under the direction of the Street Department.

Awning at the North Ferry, East Boston. Plans and specifications were made for an awning over the sidewalk in front of the head-house at the North Ferry, East Boston; the work was done by W. H. Ellis & Co., at a cost for contract work of $698.64.

Highland Park.

During the early part of the past year work was resumed on Highland Park, Roxbury, and sufficient seeding down was done to preserve the portion of the Old Fort already graded; the greater part of the platform or top was finished and covered with clean gravel, making it available for the purpose for which it was designed, viz., an elevated playground for children or general concourse; this result was made possible by the co-operation of the Sanitary Division of the Street Department in furnishing ashes for filling free of charge.

The total cost of the work done during the season was $573.22.

Widths of Draw-Openings.

The widths of draw-openings in the bridges over tide water in this city have all been remeasured for this report.

Appendix A. — Table showing the widths of openings for vessels in all bridges provided with draws.

Appendix B. — Table of accident and other plans made for the Law Department.

Appendix C. — Table of surveys, plans and profiles made by Surveying Division.

Appendix D. — Edgestone and sidewalk assessment plans made for the Paving Division, Street Department.

Appendix E. — List of streets where lot frontages have been obtained for Sewer Division, Street Department, for sewer assessments.
Appendix F. — Engineering Department property schedule.
Appendix G. — Elevations referred to Boston City base.
Appendix H. — Engineering Department Annual reports 1867–1897.

Respectfully submitted,

William Jackson,
City Engineer.

CITY ENGINEERS.

1850–1896.

E. S. CHESBROUGH, M. Am. Soc. C. E.,
Nov. 18, 1850, to October, 1855.
(Died Aug. 18, 1886.)

JAMES SLADE,
Oct. 1, 1855, to April 1, 1863.
(Died Aug. 25, 1882.)

N. HENRY CRAFTS,
April 1, 1863, to Nov. 25, 1872.

JOSEPH P. DAVIS, M. Am. Soc. C. E.,
Nov. 25, 1872, to March 20, 1880.
(Resigned March 20, 1880.)

HENRY M. WIGHTMAN, M. Am. Soc. C. E.,
April 5, 1880, to April 3, 1885.
(Died April 3, 1885.)

WILLIAM JACKSON, M. Am. Soc. C. E.,
April 21, 1885, to the present time.

APPENDIX A.

Table showing the Widths of Openings for Vessels in all Bridges provided with Draws, in the City of Boston, January, 1897.

Name of Bridges.	Location.	Number of Openings.	Width.	
			Feet.	In.
Boston & Maine R.R.	Boston to Charlestown	1	39	7
" " "	Over Miller's River	1	35	10
Broadway	Over Fort-point Channel	1	43	3
Cambridge-st.	Brighton to Cambridge	1	36	4
Canal	Boston to East Cambridge	1	36	1
Charles-river	Boston to Charlestown	1	36	0
Chelsea (South Channel)	Charlestown to Chelsea	1	38	9
" (North ")	" " "	1	44	10
Chelsea-st. (East Boston side)	East Boston to Chelsea	2	36	0
" (Chelsea side)	" " "	–	36	0
Commercial-point	Dorchester	1	24	0
Congress-st. (Boston side)	Over Fort-point Channel	2	43	3
" (So. Boston side)	" " "	–	43	9
Dover-st.	" " "	1	36	10
Eastern R.R.	Boston to Charlestown	1	39	8
" "	Over Miller's River	1	35	6
Essex-st.	Brighton to Cambridge	1	35	9
Federal-st.	Over Fort-point Channel	1	41	10
Fitchburg R.R.	Boston to Charlestown	1	36	0

Fitchburg R.R. (for teaming freight)	Boston to Charlestown	1	36	0
Grand Junction R.R.	Brighton to Cambridge	1	35	9
" " "	East Boston to Chelsea	1	34	6
Granite	Dorchester to Milton	1	36	0
Harvard (Boston side)	Boston to Cambridge	2	36	6
" (Cambridge side)	" " "	–	36	10
L-street	Over Reserved Channel, South Boston	1	40	0
Lowell R.R. (freight)	Boston to East Cambridge	1	40	2
" " (passenger)	" " "	1	39	7
Malden	Charlestown to Everett	1	43	4
Meridian-st. (East Boston side)	East Boston to Chelsea	2	59	2
" (Chelsea side)	" " "	–	59	0
Mt. Washington-ave. (Boston side)	Over Fort-point Channel	2	42	3
" " (So. Boston side)	" " "	–	42	3
Neponset	Dorchester to Quincy	1	36	0
New York & New England R.R. (Boston side)	Over Fort-point Channel	2	41	8
" " " (So. Boston side)	" " "	–	40	8
" " "	Over South Bay	1	28	4
North Beacon st.	Brighton to Watertown	1	30	2
North Harvard-st.	Brighton to Cambridge	1	36	0
Old Colony R.R.	Over Fort-point Channel	1	36	4
" "	Dorchester to Quincy	1	36	0
Prison-point	Charlestown to Cambridge	1	36	0
Warren	Boston to Charlestown	1	36	0
West Boston (Boston side)	Boston to Cambridge	2	35	6
" (Cambridge side)	" " "	–	36	6
Western ave.	Brighton to Cambridge	1	36	0
"	Brighton to Watertown	1	35	10

APPENDIX B.

TABLE OF ACCIDENT AND OTHER PLANS MADE FOR THE LAW DEPARTMENT, FROM FEB. 1, 1896, TO FEB. 1, 1897.

BOSTON PROPER.

Allen street. — Plan of street in front of Nos. 20 and 22.
Atlantic avenue. — Plan of, corner of Congress street.
Auburn street. — Plan of street at corner of Poplar street.
Bothnia street. — Plan of street, near Belvidere street.
Boylston street. — Plan of street at corner of Tremont street.
Boylston street. — Plan of street in front of No. 182.
Brighton street. — Plan of estate No. 102.
Brighton street. — Plan of estate No. 104.
Brighton street. — Plan of estate No. 106.
Broad street. — Plan of street in front of No. 185.
Buckingham street. — Plan of street in front of No. 25.
Bulfinch street. — Plan of street in front of No. 3.
Causeway street. — Plan of street opposite Portland street.
Chandler street. — Plan of street in front of Castle Square Theatre.
City Hospital. — Plan of fence around Contagious Department.
Common street. — Plan of street in front of Nos. 10 and 10½.
Cotting street. — Plan of estate No. 13.
Cotting street. — Plan of street in front of No. 21.
Cotting street. — Plan of street, corner of Leverett street.
Cross street. — Plan of street in front of Nos. 61 and 63.
Derne street. — Plan of street from Temple street to Bowdoin street.
Dock square. — Plan of, at corner of Exchange street.
East Canton street. — Plan of street in front of No. 47.
Eastern avenue. — Plan of, in front of No. 22.
Fleet street. — Plan of street in front of No. 32.
Green street. — Plan of street, corner of Norman street.
Gray street. — Plan of street, corner of Clarendon street.
Hanover street. — Plan of street, near Washington street.
Harrison avenue. — Plan of, corner of Harvard street.
Harrison avenue. — Plan of, in front of No. 372.
Holyoke street. — Plan of street in front of No. 16.
Huntington avenue. — Plan of, in front of No. 185.
Joy street. — Plan of street in front of No. 23.
Kingston street. — Plan of street in front of No. 157.
Kneeland street. — Plan of street in front of Nos. 163 and 165.
Lawrence street. — Plan of street in front of No. 1½.

Leverett street. — Plan of street, corner of Minot street.
Lincoln street. — Plan of street, corner of Essex street.
Margaret street. — Plan of street in front of No. 7.
Marlboro' street. — Plan of street, corner of Gloucester street.
Marlboro' street. — Plan of street, corner of Gloucester street.
Northampton street. — Plan of street in front of No. 78.
Oneida street. — Plan of street in front of No. 33.
Pemberton square. — Plan of, in front of No. 10.
Poplar street. — Plan of estate No. 92.
Revere street. — Plan of estate, corner of Anderson street.
Shawmut avenue. — Plan of, corner of Osborn place.
Shawmut avenue. — Plan of, in front of No. 279.
Spring street. — Plan of street in front of No. 28.
Tileston street. — Plan of estate No. 33.
Tremont street. — Plan of street in front of No. 168.
Tremont street. — Plan of street in front of Tremont Theatre.
Tremont street. — Plan of street in front of No. 791.
Trumbull street. — Plan of street, near Ivanhoe street.
Tyler street. — Plan of street in front of No. 13.
Utica street. — Plan of street, corner of Kneeland street.
Warrenton street. — Plan of estate No. 86.
Washington street. — Plan of street, opposite Franklin street.
Washington street. — Plan of street at Haymarket square.
Washington street. — Plan of street, corner of Motte street.
Webster avenue. — Plan of estate No. 40.
West Newton street. — Plan of street, corner of Washington street.
West Newton street. — Plan of street, corner St. Botolph street.

SOUTH BOSTON.

Bolton street. — Plan of street in front of No. 70.
Broadway bridge. — Plan of, near Foundry street.
Dorchester avenue. — Plan of, in front of No. 177.
East Broadway. — Plan of, in front of No. 789.
East Eighth street. — Plan of street in front of No. 497.
Mercer street. — Plan of street in front of No. 38.
Old Harbor street. — Plan of street in front of No. 25.
P street. — Plan of street in front of No. 35.
Rogers street. — Plan of street, near Dorchester street.
West First street. — Plan of street in front of Nos. 417 and 419.
West Third street. — Plan of street at A street.

EAST BOSTON.

Jeffries street. — Plan of street at Marginal street.
Putnam street. — Plan of street in front of Nos. 150 and 152.

CHARLESTOWN.

Bartlett street. — Plan of street in front of No. 75.
Bunker Hill street. — Plan of street, corner of Lexington street

Ferrin street. — Plan of northerly side of street, between Edgeworth street and Jackson street.
Main street. — Plan of street in front of No. 172.
Monument avenue. — Plan of, in front of No. 14.
Russell street. — Plan of street in front of No. 8.
Warren street. — Plan of street, near Winthrop street.

Roxbury.

Conant street. — Plan of street, corner of Oregon street.
Crawford street. — Plan of street in front of No. 94.
Forest street. — Plan of street in front of No. 76.
Massachusetts avenue. — Plan of, near Swett street.
Minden street. — Plan of street, corner of Schiller street.
Seaver street. — Plan of street in front of No. 10.
St. Alphonsus street. — Plan of street in front of No. 44.
St. James street. — Plan of street, corner of Alpine street.
Sterling street. — Plan of street, near Cabot street.
Vernon street. — Plan of street at Vernon place.
Washington street. — Plan of street at corner of Guild street.
Washington street. — Plan of street at Hulbert street.
Washington street. — Plan of street in front of No. 2750.
Weston street. — Plan of street in front of No. 24.
Windsor street. — Plan of street in front of No. 43.
Winthrop street. — Plan of street in front of No. 17.
Winthrop street. — Plan of street in front of No. 96.

Dorchester.

Blue Hill avenue. — Plan of near McLellan street.
Milton avenue. — Plan of near Norfolk street.
Norfolk street. — Plan of street opposite Engine House.

West Roxbury.

Ashland street. — Plan of street corner of Hyde Park avenue.
Washington street. — Plan of street near Metropolitan avenue.
Washington street. — Plan of street corner of Hemlock street.

Brighton.

Commonwealth avenue. — Plan of near Lake street.
Commonwealth avenue. — Plan of at the Newton Line.
Washington street. — Plan of street at Oak square.

APPENDIX C.

TABLE OF SURVEYS, PLANS AND PROFILES MADE BY THE SURVEYING DIVISION OF THE ENGINEERING DEPARTMENT, FROM FEB. 1, 1896 TO FEB. 1, 1897.

Boston Proper.

Aberdeen street. — Plan and profile of proposed laying out and established grade, from Beacon street to Brookline Branch of the Boston & Albany Railroad.

Albany street. — Plan of easterly side of City Hospital lot showing building and areas.

Alden street and vicinity. — Tracing for Street Commissioners.

Allen street. — Poplar street and Chambers street. Accurate plan of estates for taking for school purposes.

Allston street. — Bowdoin street to Somerset street. Plan and profile for proposed grade.

Anderson street. — Sharpe School. Plan of proposed addition to lot.

Appleton street. — Tremont street to Columbus avenue. Plan and profile for revision of grade.

Ashburton place. — Somerset street to Bowdoin street. Plan and profile for proposed grade.

Beach street. — Federal street to South street. Profile to establish grade.

Belvidere street. — Mechanics Arts building, showing line.

Bennet avenue and Prince street. — Addition to plan of estate.

Bennet avenue and Prince street. — Approximate plan of estate.

Berwick park. — Columbus avenue to Carleton street. Profile of curb.

Billerica street. — North-easterly side. Profile of edgestone.

Bowdoin street. — Beacon street to Allston street. Plan and profile for proposed grade.

Bulfinch place. — Bulfinch street to Bowdoin street. Plan and profile for proposed laying out and grade.

Cambridge street. — Near Bowdoin square. Proposed widening.

Canal street. — Plan for proposed widening.

Carleton street. — From West Newton street to Berwick park. Plan and profile for proposed laying out and grade.

Carver street. — Boylston street to Eliot street. Profile of edgestone.

Chestnut street. — Charles street to Charles river. Plan and profile of curb for revising grade.
Clinton street. — Betterment plan.
Common street. — Brimmer School. Plan for Superintendent of Public Buildings.
Concord square. — Tremont street to Columbus avenue. Plan and profile of curb for revision of grade.
Congress street. — Plan of proposed widening, from Atlantic avenue to bridge.
Cove street. — Plan of estates to be taken for proposed widening.
Cove street. — Kneeland street to East street. Plan and profile of proposed relocation and grade.
Dorchester avenue. — Proposed extension, from Federal street to Summer street extended.
Dover street. — Bath-house lot. Showing Fire Department building in rear.
Dover street. — And passageway in rear. Plan showing heights and grades for bath-house.
East street. — Federal street to South street. Profile to establish grade.
East Dedham street. — Washington street to Harrison avenue. Profile of part of curb for revision of grade.
East Brookline street. — Washington street to Harrison avenue. Plan and profile of curb for revision of grade.
Essex street. — South street to Federal street. Plan and profile for grade.
Federal street. — Proposed widening Summer street to East street.
Federal street. — Plan and profile from Purchase street to Atlantic avenue.
Federal street. — Essex street to Summer street. Plan and profile to establish grade.
Federal street. — From the bridge northerly. Profile of curb.
Fort Point Channel. — Plan of proposed new street, from opposite Oliver street to Congress street, showing approximate takings.
Friend street. — Causeway street to Merrimac street. Profile of edgestone.
Fullerton street. — Plan and profile of laying out and established grade from Brookline avenue to Fairhaven street.
Fullerton street. — Plan for construction assessment from Brookline avenue to Fairhaven street.
Garden Court street. — Plan and profile for revision of grade.
Harvard street. — Washington street to Hudson street. Plan and profile for revision of grade.
Haverhill street. — Plan for proposed widening.
Haverhill street. — North of Causeway street. Plan for Superintendent of Streets.
Holyoke street. — Plan and profile of curb for revision of grade.
King's Chapel Burying-ground. — Plan showing location of gravestones on north side.

Mt. Washington avenue. — Federal street to bridge. Profile to establish grade.

Norway street. — Plan and profile of laying-out and established grade from Massachusetts avenue to Parker street.

Norway street. — Plan for construction assessment, from Massachusetts avenue to Parker street.

Peterborough street. — Plan and profile of laying out and established grade from Boylston road to Audubon road.

Peterborough street. — Plan for construction assessment, from Boylston road to Audubon road.

Prince street. — Corner Bennet avenue. Estates taken for school purposes.

Prince street. — Northerly corner Bennet avenue. Plan showing heights and grades for new school-house.

Queensberry street. — Plan and profile of proposed laying out and established grade, from Boylston road to Audubon road.

Somerset street. — Beacon street to Howard street. Plan and profile for proposed grade.

South Russell street. — At Myrtle street. Profile of curb and school-house.

Stillman street. — Charlestown street to Endicott street. Plan and profile of curb for revision of grade.

State street. — Brazer Building. Plan of proposed widening and discontinuance.

Summer street. — From Purchase street to Harbor line. Plan and profile for proposed laying out and grade.

Street from Dartmouth street to Trinity place. — Plan and profile for proposed laying out and grade.

Trinity place. — From St. James avenue to railroad. Plan and profile for proposed laying out and grade.

Union Park street. — Washington street to Harrison avenue. Plan and profile of curb for revision of grade.

Wall street. — Plan and profile of curb for revision of grade.

Webster avenue. — Profile of buildings.

West Brookline street. — Tremont street to Shawmut avenue. Profile of part of curb for revision of grade.

West Brookline street. — Washington street to Shawmut avenue. Plan and profile of curb for revision of grade.

West Newton street. — At Carleton street. Plan and profile for grade.

Yarmouth street. — Plan and profile of curb for grade.

South Boston.

Atlantic street. — Plan and profile of proposed laying out and grade, showing proposed steps between East Eighth street and Thomas park.

East Sixth street. — Northerly corner H street. Plan of the Kindergarten school annex to Thomas N. Hart school, between East Fifth street and East Sixth street.

H street. — Northerly corner East Sixth street. Plan of the Kindergarten school annex to the Thomas N. Hart school, between East Fifth street and East Sixth street.

Mt. Washington avenue. — Plan and profile of proposed laying out and extension from Harbor line to D street.

Short street. Plan and profile of proposed laying out and grade, between Middle street and Tuckerman street.

Thomas park. — Plan of reservoir lot.

Tuckerman street. — Plan and profile of proposed laying out and grade, between Dorchester street and Short street.

West Fifth street and Gold street. — Plan showing measurement and areas, between B street and D street.

West Fourth street. — Silver street and E street. Plan of the Bigelow school lot with proposed addition for grading.

East Boston (including Breeds Island).

Blackinton street. — Plan of the Blackinton school lot, for grading at westerly corner of Leyden street.

Brigham street. Approximate plan of proposed extension to Pearl place.

Marginal street. — Plan and profile of proposed extension and grade from Jeffries street to the water.

Orleans street. — Plan and profile, showing revised grade, from Maverick street to Decatur street.

Charlestown.

Chelsea street. — Approximate plan for proposed widening.

Elm street. — Five estates between Lincoln street and Hancock place. For proposed school lot.

High street. — Proposed widening.

Main street. — Plan and profile showing grade, between City square and Pleasant street.

Main street. — Profile of curb opposite Winthrop street, westerly.

Moulton street. — New school lot. Plan showing levels.

Rutherford-avenue extension. — Approximate areas for proposed new street.

Sketch of marsh and meadow lands in Charlestown.

Vine street and Bunker Hill street. — Betterment plan.

Roxbury.

Abbotsford street. — Extension. Plan and profile of proposed laying out and established grade, from Harold street to Crawford street.

Atherton street. — Extension. Plan and profile of proposed laying out and established grade, from Amory street to Lamartine street.

Bartlett street. — Northerly corner Washington street. Plan and profile of curb for grade.

Bickford avenue. — Plan and profile of proposed laying out and established grade, from Heath street to Wensley street.

Cedar street. — North-easterly side Highland street to Centre street. Plan and profile of edgestone for grade.

Clifton place. — Extension. Clifton street to Norfolk avenue. Plan and profile of buildings for Sewer Division.

Cottage place. — From Tremont street to New York, New Haven & Hartford Railroad. Plan and profile for grade.

Culvert street. — From Tremont street to Ruggles street. Plan and profile for revised grade.

Davenport street. — Plan and profile of proposed laying out and established grade, from Tremont street to Columbus avenue.

Dimock street. — Plan and profile from Amory street to beyond Columbus avenue, for revising grade.

Dudley street. — Guild row to Kenilworth street. Plan and profile of edgestone for grade.

Fairland street. — Plan of proposed re-location, from Mt. Pleasant avenue, southerly.

Fellows street. — East Lenox street to Hunneman street. Plan and profile on centre line to test grade.

Forest street. — Southerly corner Vine street. Plan and profile of curb for grade.

Forest street. — Westerly corner Vine street. Plan and profile of edgestone for grade.

Forest street and Vine street. — Plan of north-easterly corner, showing trees for Public Grounds Department.

Highland street. — North-westerly side Cedar street to Lambert avenue. Plan and profile of edgestone for grade.

Howland street. — Southerly corner Humboldt avenue. Profile of curb and gutter to test grade.

Hunneman street. — Albany street to Harrison avenue. Plan and profile on centre line to test grade.

Huntington avenue. — Corner Wigglesworth street. Plan and profile of curb.

Kenilworth street. — At Dudley street. Plan and profile of edgestone for grade.

Linden Park street. — From Roxbury street to Gay street. Plan and profile for grade.

Longwood avenue. — Plan and profile of proposed relocation and established grade, from the south-easterly side of the Riverway to the Brookline town line.

New Heath street. — Columbus avenue to Centre street. Plan and profile of curb.

Parker street. — Heath street to Fisher avenue. Plan and profile on curb line for grade.

Parker street. — Heath street to New Heath street. Plan and profile of buildings and curb for grade.

Prentiss street. — Plan and profile from Tremont street to Halleck street for revising grade.

Riverside street. — From Tremont street to Columbus avenue. Plan and profile for revision of grade.

Roxbury street and Centre street. —Plan of proposed reloca tion at junction.

Roxbury street. — Westerly corner Centre street. Plan and profile of curb and buildings for grade.

Roxbury street. — Washington street to Eliot square. Plan and profile of curb for grade.

Roxbury street. — From Columbus avenue to Elmwood street. Plan and profile of curb.

Ruggles street. — Parker street to Parkway. Plan and profile for laying out and established grade.

Ruggles street. — From Tremont street to Halleck street. Plan and profile for revision of grade.

Ruggles street. — Plan and elevations of building corner Oak Grove terrace, for Buildings Department.

Ruggles street. — Plan for construction asssesment, from Parker street to Back Bay Fens.

Sarsfield street. — From Tremont street to Grinnell street. Plan and profile for revision of grade.

Seaver street. — Plan of Franklin park lands on northerly side, between Harold street and Walnut avenue.

Station street. — From Halleck street to Columbus avenue. Plan and profile for revising grade.

Terry street. — From Tremont street to Columbus avenue. Plan and profile for revision of grade.

Tremont street. — From Parker street to Columbus avenue. Plan and profile for revising grade.

Tremont street. — At Roxbury Crossing. Plan showing levels on curb, track, etc.

Valentine street and Fulda street. — Easterly corner. Plan and profile for revision of grade.

Vancouver street. — Plan for construction assessment, from Huntington avenue to Ruggles street.

Vernon street. — Cabot street to Lamont street. Plan and profile of curb for grade.

Vine street. — Forest street to Mt. Pleasant avenue. Plan and profile of curb for grade.

Wait street. — Plan and profile of proposed widening and established grade, from Huntington avenue to Hillside street.

Walpole street. — From Columbus avenue to New York, New Haven and Hartford Railroad. Plan and profile for revision of grade.

Warren street, Regent street and St. James street. — Square at junction. Plan showing widths of sidewalk and heights of curb.

Washington street and Kenilworth street. — Plan of land to be taken for school purposes.

Washington street. — Northerly corner Bartlett street. Plan and profile of curb for grade.

Washington street and Bartlett street. — Plan of proposed widening at northerly corner.

Washington street. — Plan of proposed relocation between Dale street and Circuit street.

Washington street. — Plan showing encroachments between Dale street and Circuit street.

Weston street. — From Tremont street to Grinnell street. Plan and profile for revision of grade.

West Walnut park. — Washington street to Brunswick avenue. Plan and profile for revision of grade.

Winslow street. — Plan and profile of curb for grade.

DORCHESTER.

Alexander street. — From Oleander street to Baker place. Plan and profile for laying out and grade.

Athelwold street. — From Harvard street to Kilton street. Plan for construction assessment.

Beale street. — From Shawmut Branch Railroad to Carruth street. Plan and profile for laying out and grade.

Capen street. — From Evans street to Selden street. Plan and profile for proposed laying out and grade.

Chamberlain street. — From Harvard street to Algonquin street. Plan and profile for laying out and grade.

Chamberlain street. — From Algonquin street to Harvard street. Plan for construction assessment.

Clement street. — From Allston street to Shawmut Branch Railroad. Plan and profile of proposed laying out and grade.

Edwin street. — From Dorchester avenue to Shawmut park. Plan for construction assessment.

Elizabeth street. — From Astoria street to Norfolk street. Plan for construction assessment.

Ellet street. — From Adams street to Dorchester avenue. Plan for construction assessment.

Fairmount avenue. — From Washington street to Milton avenue. Plan and profile of proposed laying out and grade.

Fenelon street. — From Merrill street to Washington street. Plan for construction assessment.

Gaylord street. — From Chamberlain street to Washington street. Plan for construction assessment.

Granger street. — Extension through Fenno place. Plan and profile of proposed laying out and grade.

Greenbrier street. — From Bloomfield street to Bowdoin street. Plan for construction assessment.

Harvard street. — From Blue Hill avenue to Austin street. Plan and profile of proposed relocation and grade.

Hopestill street. — From Northern avenue to Southern avenue. Plan and profile of proposed laying out and grade.

Leroy street. — From Ditson street to Geneva avenue. Plan and profile of proposed laying out and grade.

McLellan street. — Blue Hill avenue to Erie street. Plan and profile for relocation and revised grade.

Mora street. — From Washington street to Milton avenue. Plan and profile for laying out and grade.

Morse street. — From Bowdoin avenue to Washington street. Plan for construction assessment.

Neponset avenue. — At north-westerly corner Freeport street. Plan of lot for Park Department.

Newhall street. — From Ashmont street to Pierce avenue. Plan and profile for revising grade.

Nightingale street. — From Bernard street to Talbot avenue. Plan and profile for laying out and grade.

Norfolk street. — Opposite Walk Hill street. Plan for relocation.

Northern avenue. — From Washington street to Talbot avenue. Plan and profile for laying out and grade.

Nottingham street. — From Bowdoin avenue to Bullard street. Plan and profile of proposed laying out and grade.

Old road. — From Glenway street, south, to near Wales street. Plan for discontinuance.

Page avenue. — From McLellan street to Glenway street. Plan and profile for laying out and grade.

Pierce avenue. — From Adams street to Neponset avenue. Plan and profile for laying out and grade.

Puritan avenue. — From Richfield street to private way. Plan and profile of proposed laying out and grade.

Randolph terrace. — From Rowena street to Van Winkle street. Plan and profile for laying out and grade.

River street. — At Blue Hill avenue. Plan for relocation.

Robinson street. — From Adams street to Draper street. Plan and profile for revising grade.

Shelton street extension. — Plan and profile for revising grade.

Taylor street. — From Neponset avenue to Rice street. Profile for grade.

Wessex street. — From Van Winkle street to Codman street. Plan and profile for laying out and grade.

Weyanoke street. — From Carruth street to Wessex street. Plan and profile for laying out and grade.

Wilder street. — From Geneva avenue to Washington street. Plan for construction assessment.

Wolcott street. — From Columbia street to Erie street. Plan for construction assessment.

West Roxbury.

Beech street. — Plan of school-house lot, near Kittredge street, showing grades for architect.

Canterbury street. — Plan showing line of street between Hyde Park avenue and Sharon street.

Cohasset street. — Profile from Corinth street, southerly, for revising grade.

Fletcher street. — Plan and profile of proposed laying out and established grade from South street to the Bradford estate.

Franklin place. — Plan of surrounding estates for Sewer Division of the Street Department.

Hewlett street. — Plan and profile from Walter street, westerly, for revising grade.

Hyde Park avenue. — Washington street and Walk Hill street. Plan of triangle, showing frontages for edgestone.

La Grange street and Bellevue street. — Plan of land taken for playground.

Morton street. — Plan and profile of proposed laying out and established grade, between Park street and La Grange street.

Paul Gore street. — Plan of land on northerly side purchased for school-house lot.

Peter Parley street. — Plan and profile between Washington street and Forest Hills street, for revising grade.

Sharon street. — Plan of Stephen M. Weld Primary School, for Public Buildings Department.

South street. — Profile of roadway, showing grade between Walter street and Congreve street.

South street. — Profile from Washington street to railroad crossing on line of proposed widening.

Walk Hill street. — Plan of land at the corner of Wachusett street taken for school-house lot.

Weld avenue. — Plan and profile of curb from Columbus avenue to School street.

BRIGHTON.

Bigelow street. — Plan and profile between Brooks street and Dunboy street for revising grade.

Bigelow street. — Plan and profile from Faneuil street, northerly, to bend for establishing grade.

Brighton avenue. — Betterment plan between Commonwealth avenue and Cambridge street.

Brooks street. — Plan and profile showing proposed relocation, extension and grade between Holton street and North Beacon street.

Cambridge street. — Plan of new Brighton High School-house lot at Warren street, for Public Buildings Department.

Cambridge street. — Plan showing land added to the Allston School lot.

Cambridge street. — Plan showing proposed widening between Warren street and Dustin street.

Chiswick road. — Plan of school-house lot at Chestnut Hill avenue, showing grades for architect.

Commonwealth avenue. — Assessment plan for laying out between Chestnut Hill avenue and Newton line.

Commonwealth avenue. — Assessment plan for construction between Chestnut Hill avenue and Newton line.

High street. — Plan and profile showing proposed laying-out and grade, between Dunboy street and Bigelow street.

Mackin street and Richardson street. — Plan showing land added to the William Wirt Warren School lot.

Mackin street and Richardson street. — Plan of school-house lot, showing grades, for Public Buildings Department.

Malvern street. — Plan and profile, showing proposed laying out and grade between Brighton avenue and Ashford street.

Melton road. — Plan and profile, showing proposed laying-out and grade from Wallingford road to Colonial road.

Menlo street. — Plan for proposed relocation near Sparhawk street.

Nonantum street. — Plan of Oak Square Primary School-house lot for Public Buildings Department.

Nottingham road. — Plan and profile, showing proposed laying-out and grade from Melton road.

Surrey street. — Plan and profile, showing proposed laying-out and grade between Market street and Parsons street.

Tremont street. — Plan and profile, showing proposed relocation and grade between Washington street and Newton line.

Wallingford road. — Plan and profile, showing proposed laying-out and grade between Commonwealth avenue and Chestnut Hill avenue.

APPENDIX D.

EDGESTONE AND SIDEWALK ASSESSMENT PLANS MADE FOR THE PAVING DIVISION OF STREET DEPARTMENT.

City Proper.

Boylston street. — Southerly side, from Exeter street to Boston & Albany Railroad. Edgestone assessment plan.
Columbus avenue. — Opposite Ferdinand street. Sidewalk assessment plan.
Columbus avenue. — Northerly corner Northampton street. Sidewalk assessment plan.
Laconia street. — Edgestone assessment plan.

Roxbury.

Alaska street. — Part of southerly side for sidewalk assessment.
Elm Hill avenue. — Northerly corner Howland street. Plan for sidewalk assessment.
Galena street. — Edgestone assessment plan.
Gaston street. — Southerly side Blue Hill avenue to bend. Plan for sidewalk assessment.
Gaston street. — South-easterly corner Warren street. Plan for sidewalk assessment.
Hammond street. — Nos. 10 to 14. Plan for sidewalk assessment.
Harold street. — Easterly corner Homestead street. Plan for sidewalk assessment.
Hazelwood street. — Measurement for assessment plan.
Homestead street. — Easterly corner Harold street. Plan for sidewalk assessment.
Howland street. — Northerly corner Elm Hill avenue. Plan for sidewalk assessment.
Ingleside street. — Edgestone assessment plan.
Maywood street. — From Warren street. Plan for sidewalk assessment.
Ottawa street. — Southerly side. Sidewalk assessment plan.
Quincy street. — Northerly side, Warren street to Blue Hill avenue. Plan for sidewalk assessment.
Sterling street. — Northerly corner Shawmut avenue. Plan for sidewalk assessment.
Sterling street. — Southerly corner Westminster street. Plan for sidewalk assessment.

Dorchester.

Algonquin street. — Southerly corner Harvard street. Sidewalk plan.
Argyle street. — Plan for edgestone assessment.
Bellflower street. — Edgestone assessment plan.
Dean street. — Edgestone assessment plan.
Hartland street. — Edgestone assessment plan.
Romsey street. — Dorchester avenue to Sydney street. Edgestone assessment plan.
Salcombe street. — Cushing avenue to Stoughton street. Edgestone assessment plan.
Sydney street. — Hartland street to Crescent avenue. Edgestone assessment plan.
Wheatland avenue. — Washington street to Whitfield street. Edgestone assessment plan.
Talbot avenue. — Norfolk street to New England Railroad. Edgestone assessment plan.
Talbot avenue. — Easterly side, at Dorchester avenue. Edgestone and sidewalk assessment plan.

South Boston.

D street. — West First street to West Second street. Sidewalk assessment plan.
East Sixth street. — M street to N street. Sidewalk assessment plan.
East Sixth street. — N street to O street. Sidewalk assessment plan.
Rawson street. — Edgestone assessment plan.

APPENDIX E.

LIST OF STREETS WHERE LOT FRONTAGES HAVE BEEN OBTAINED FOR THE SEWER DIVISION OF THE STREET DEPARTMENT FOR SEWER ASSESSMENTS FROM FEB. 1, 1896, TO FEB. 1, 1897.

Boston Proper.

Atlantic avenue. — From Congress street to Oliver street.
Audubon road. — From Beacon street to Boston & Albany Railroad.
Beach street. — From Washington street to Harrison avenue.
Congress street. — From Atlantic avenue to Fort Point channel.
Dundee street. — From Massachusetts avenue to Dalton street.
Endicott street. — From Thacher street to Causeway street.
Flagg street. — From Washington street to Harrison avenue.
Huntington avenue. — Both corners of Norway street.
Laconia street. — From Washington street to Harrison avenue.
Malden street. — From Washington street to Harrison avenue.
Malden street. — From Harrison avenue to Albany street.
Norway street. — From Huntington avenue to Falmouth street.
South Russell street. — From Myrtle street to Cambridge street.
Thacher street. — From Endicott street to North Margin street.
Tyler street. — From Beach street to Harvard street.
Tyler street. — From Oak street to Curve street.

South Boston.

D street. — From West First street to West Second street.
E street. — From West Seventh street to West Eighth street.
New York, New Haven & Hartford Railroad. — From Vinton street to Boston place.
Rawson street. — From Dorchester avenue to Boston street.
West Second street. — From D street to E street.

East Boston (including Breeds Island).

Ashley avenue. — At and near Breed street.
Leyden street. — From Breed street to Chelsea avenue.
Liverpool street. — From Decatur street to Central square.
Meridian street. — From Condor street to Nay street.
Saratoga street. — From Bennington street to Austin avenue.

CHARLESTOWN.

St. Martin street. — From Medford street to Bunker Hill street.

ROXBURY.

Bickford street. — From Centre street to Bromley park.
Bryant street. — Near Huntington avenue.
Danforth street. — Near Wyman street.
Evergreen street. — From Day street, westerly.
Heath street. — From Columbus avenue to New Heath street.
Kearsarge avenue. — From Warren street, easterly.
Munroe street. — From Harold street to Humboldt avenue.
Northampton street. — From Albany street to Fellows street.
Parker street. — From Huntington avenue to Westland avenue.
Shawmut avenue. — From Roxbury street to Vernon street.
Ward street. — From Halleck street to New York, New Haven & Hartford Railroad.
Wensley street. — From Parker street to Bucknam street.

DORCHESTER.

Bowdoin street. — At Quincy street.
Capen street. — Norfolk street to Fuller street.
Chapman avenue. — Don street to Lyons street.
Dorchester avenue. — Richmond street to Adams street.
Edwin street. — From Dorchester avenue to Shawmut park.
Fuller street. — From Capen street to Nelson street.
Lawrence avenue. — At Mascoma street.
Morton street and Selden street. — At junction.
Morton street and Evans street. — At junction.
Norfolk street. — Near Morton street.
Richmond street. — Dorchester avenue to Washington street.
Robinson street. — From Draper street to Montello street.
Rosemont street. — From Adams street to Dorchester avenue.
Stoughton street. — From Salcombe street to Everett avenue.
Washington street. — From Adams street to bridge.
Washington street. — From Fuller street to south of Codman street.
Willowwood street. — From Norfolk street to Lauriat avenue.

WEST ROXBURY.

Arundel street. — Walter street to Centre street.
Beech street. — Newburg street to Parkway.
Birch street. — South street to Corinth street.
Bourne street. — Canterbury street to Wallace park.
Canterbury street. — At Walk Hill street.
Canterbury street. — Walk Hill street to Bourne street.
Centre street. — Boylston terrace to Boylston street.
Centre street. — Near Lochstead street.
Corey street. — Near Centre street.

Florence street. — At Stony brook.
Franklin place. — From Washington street.
Hyde Park avenue. — Stony brook to Walk Hill street.
Jamaicaway. — At Perkins street.
Kirk street. — Montview street to Crest street.
Louder's Lane. — From Centre street.
Montview street. — Corey street to Hastings street.
Mozart avenue. — Walter street to Selwyn street.
Mt. Vernon avenue. — From Rockland street.
Rockland street. — Mt. Vernon street to Mt. Vernon avenue.
Sedgwick street. — Near South street.
Selwyn street. — Near Arundel street.
Walk Hill street. — Canterbury street to Paine street.
Walk Hill street. — Wachusett street, easterly to bend.

Brighton.

Allston square.—
Bigelow street. — Brooks street to Webster street.
Brooks street. — Boston and Albany Railroad to Gerrish street.
Cambridge street. — Rugby street to Dustin street.
Cambridge street. — Cambridge terrace to Allston Heights.
Etna street. —North Beacon street to Elmira street.
Everett street. — At North Beacon street.
Gerrish street. — Brooks street to Newton street.
Hobart street. — Near Brooks street.
Holmes avenue. — Harvard avenue to Warren street.
Holton street. — Athol street to Everett street.
Murdock street. — Cambridge street to Sparhawk street.
Newton street. — Brooks street to Bigelow street.
North Harvard street. — Hopedale street to Coolidge road.
North Harvard street. — Western avenue to Charles river.
Parkman street. — Brooks street, westerly.
Western avenue. — Everett street to Waverley street.

APPENDIX F.

Engineering Department Property Schedule, Main Office.

1 horse.
2 carriages.
1 sleigh.
2 harnesses.
3 robes.
Instruments for drawing.
Instruments for surveying, as follows:
1 Temple transit.
5 Buff & Berger transits.
8 Gurley transits.
1 Stackpole transit.
2 Temple levels.
4 Buff & Berger levels.
5 Gurley levels.
11 Boston rods.
3 New York rods.
4 Troy rods.
Cases for plans and books.
Reference Library, 1,103 volumes.
10,200 Plans Engineering Works, loose.
14 volumes Plans Engineering Works, bound.
Photographs of Engineering Works.
Apparatus for blue printing.
1 microscope.
1 mercurial barometer.
1 aneroid barometer.
1 holosteric barometer.
1 set hydrometers.
1 hygrometer.
1 pair field glasses.
2 typewriters.
2 dynamometers.
1 pentagraph.
1 calculating-machine.
1 volt meter.
1 comptometer.
2 thermophones.

Surveying Division.

3 Temple transits.
2 Moody transits.
2 Buff & Berger transits.
3 Stackpole transits.
1 Troughton & Sims transit.
1 Poole transit.
1 Archibut transit.
1 King transit.
5 Buff & Berger levels.
1 Moody level.
2 Temple levels.
1 Ewing level.
1 Gurley level.
7 Rods.

APPENDIX G.

Elevations referred to Boston City base. (The city base is 0.64 feet below mean low tide.)

Feet.	
0.00	City base.
15.66	Highest tide, April 16, 1851.
15.33	Coping of dry dock, Charlestown Navy Yard.
12.34	Greatest elevation of high tide, per United States Tide Tables, Nov. 26, 1897 (11.7 + 0.64) = 12.34.
7.74	Least elevation of high tide, per United States Tide Tables, Feb. 11, 1897 (7.1 + 0.64) = 7.74.
2.84	Greatest elevation of low tide, per United States Tide Tables, Sept. 19 and 20, 1897 (2.2 + 0.64) = 2.84.
— 1.26	Least elevation of low tide, per United States Tide Tables, April 18 and 19, Oct. 27, and Nov. 25, 1897 (— 1.9 + 0.64) = — 1.26.
0.64	Mean low tide.
5.00	Piles cut off for building.
9.91	Water-works base (approximate tide-marsh level).
— 4.98	Cambridge city base.
0.38	South Boston flats base.

NOTE. — Cambridge city base is 4.98 feet below Boston city base.

APPENDIX H.

ENGINEERING DEPARTMENT ANNUAL REPORTS, 1867–1897.

No. of Reports.	For the Year.	Year published and No. City Document.	No. of Reports.	For the Year.	Year published and No. City Document.
First	1867	1868 — 22	Eighteenth	*1884	1885 — 54
Second and Third	1868–69	1870 — 14	Nineteenth	*1885	1886 — 41
Fourth	1870	1871 — 15	Twentieth	*1886	1887 — 38
Fifth and Sixth	*1871–72	1873 — 23	Twenty-first	1887	1888 — 39
Seventh	*1873	1874 — 20	Special report	1888	1888 — 117
Eighth	1874	1875 — 19	Twenty-second	1888	1889 — 38
Ninth	1875	1876 — 24	Twenty-third	1889	1890 — 39
Tenth	*1876	1877 — 15	Twenty-fourth	*1890	Executive Department Report, Document 1, Part I. 1891.
Eleventh	*1877	1878 — 20			
Twelfth	*1878	1879 — 22	Twenty-fifth	1891	1892 — 11
Thirteenth	*1879	1880 — 33	Twenty-sixth	1892	1893 — 10
Fourteenth	*1880	1881 — 25	Twenty-seventh	1893	1894 — 10
Fifteenth	1881	1882 — 52	Twenty-eighth	1894	1895 — 10
Sixteenth	1882	1883 — 53	Twenty-ninth	1895	1896 — 10
Seventeenth	*1883	1884 — 55	Thirtieth	1896	1897 — 10

*Out of print.

TABLE OF CONTENTS.

CONTENTS — REPORT ENGINEERING DEPARTMENT FOR 1896.

[General index to contents Engineering Department Reports, 1867–1892 will be found in Report of February 1, 1892.]

ILLUSTRATIONS.

APPENDICES.